

*From the College of Physicians,
Oct. 5. 1700.*

Mr. Smith,

I Have Read the Book
you sent me, which, for
the great Discoveries con-
tain'd therein, is justly En-
titled, *The Mysteries of O-*
pium Reveal'd: It has no
need of Mine, nor of any
other Approbation: For such
Extraordinary Performances,
as this is, are more secure of
a Kind Reception in the
World by their own great
Worth, and Usefulness to
the Publick, than by any
other Recommendation what-
soever.

Yours,

THOMAS BURWELL.

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THOMAS BURWELL.

John W. Headwell 1817

THE
MYSTERIES
OF
OPIUM
Reveal'd,

BY
Dr. JOHN JONES,

*Chancellor of Landaff, a Member of the College
of Physicians in LONDON: And formerly
Fellow of Jesus-College in OXFORD.*

WHO,

I. Gives an Account of the Name, Make, Choice, Effects,
&c. of Opium.

II. Proves all former Opinions of its Operation to be meer
Chimera's.

III. Demonstrates what its true Cause is; by which he
easily, and Mechanically explains all (even its most myste-
rious) Effects.

IV. Shews its noxious Principle, and how to separate it;
thereby rendering it a safe, and noble *Panacea*; whereof,

V. He shews the *palliative*, and *curative Use*.

A DEO LUX.

LONDON:

Printed for Richard Smith at the Angel and Bible without
Temple-Bar. MDCCI.

X
G. MITCHEL.

TO THE
KINGS

Most Excellent Majesty,
William III. &c.

H
I have the honor to receive
your Majesty's command
in relation to the
summons of the
House of Commons
to sit on the 14th
of November next
at Whitehall
and I have the honor
to acknowledge the
same.

TO THE
KINGS

Most Excellent Majesty,
William III. &c.

May it please Your Majesty,

HAVING no Means to atone
for my *bold Essay* to exprels
Your MAJESTY's *glor-*
ious Acts, and Virtues upon a *small*
Pillar, (as much too narrow to con-
tain, as my *Pen* was too short to
reach *them*) but by this *Poor Sacr-*
fice, making *one Presumption* the
Advocate of the other, (as if *Offences*
bore no *Proportion* to Your ROYAL
Notice, and *Clemency* without accu-
mulating them) I humbly implore

A 4

GOD's

DEDICATION.

GOD's *Representative* in *Mercy*, as well as *Power*, to be a *Saviour* in *pardoning*, as well as *preserving*. I confess my *Attempt* as *daring* and *Assuming*, as that of the *Arrogant*, and *Sturdy Giants* to *scale Heaven*, being too great a *Task* for a general *Consult* of the most *exalted Wits* on *Earth*, if not of *Angels*, and *refin'd separate Souls*, of whose *Number* mine, by frequent *Ecstasies* of *Thanks*, and *Praises*, for the *Wonders* Your MAJESTY has wrought for us, seems as it were *ambitious* to be *one*; as well knowing, that such *miraculous Exploits* far transcend the *Conceptions*, and *highest Flights* of those that are *clog'd* with *Bodies*; which had quite *balk'd* my *Endeavours* to describe them, but that those *uncontrollable Raptures* used *Violence* upon my *Modesty*, and a *long defeated Expectation* of better *Pens* render'd my *Impatience* *outrageous*, to find *Men* *silent*, where they

DEDICATION.

they cannot be loud enough; as if the Impracticableness of adequate Thanks had pall'd their Spirits; Or the vast Cataracts of Blessings Your MAJESTY pour'd upon us had overwhelm'd; Or the consequent Ease, and Security lull'd them asleep; Or our exuberant Prosperity overgrown the Memory of its brave, and generous Author: The Thoughts of which Ingratitude, what Loyal, or Moral Heart can bear without the highest Indignation? The Fret, and Ferment whereof would have even bursted its Vessel without the Vent I gave it in expressing my Thoughts upon that Pillar; to mind the forgetful, excite the Lethargick, and give all a Model by my Paper-building to erect more sumptuous and permanent Monuments of what GOD, and Your MAJESTY's unparallel'd Magnanimity, Courage, and Conduct, have done for us.

Since that was my Design, Gratitude my Motive, Deeds and Qualifica-

DEDICATION.

fications, that have no *commensurate Words*, my *Theme*; I hope *Defects in Expression* will not intercept a *gracious Aspect*.

If the *Book* affords any *Thing new*, or *useful*, Your MAJESTY is the *Author*, as *Preserver* of our *Lives*, and *Establisber* of the necessary *Tranquillity* for *Thoughtful Studies*, and *Inventions*; therefore I humbly present it to Your most *Sacred* MAJESTY, as *Men* do *Oblations* to the DEITY from whom they receiv'd them; making it (as far as in me lies) doubly Yours, as is,

ROYAL SIR,

Your MAJESTY's

{ *Humble*, } Subject,
{ *Most Obedient*, } And
{ *Thankful*, } Servant,

JOHN JONES.

THE
MYSTERIES
OF
OPIUM
Reveal'd.

CHAP. I.

Shews how Opium had its Name, how 'tis made, whence it comes, &c.

THE *Opium*, that was in Use in *Ancient Times*, was made thus:

When the *Poppy* (which was generally the *White*, and sow'd then only in Gardens, and small Inclosures) was come to its full growth, and most turgid of *Milky Juice*, which was in the hot Countries in *May* and *June*; they did, as soon as the *Dew* was up in the mornings, make several Incisions transversly or *athwart* the Heads of the *Poppies*, yet not directly *horizontal*, but somewhat *obliquely*, taking

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B

care

care not to make them quite through into the cavity thereof; holding the *Knife*, or *Instrument*, with which the *Incisions* were made, with its Edge sloping upward, while it wounded the Heads, and conveniently placing certain *Shells* to receive the *Milky Drops*, that issued out of the *Incisions*; and went backward among the *Poppies*, as they proceeded in this *Work*.

1. *They chose the Time when the Poppy Heads were most turgid of Milk*, to take it in the best Condition for their Purpose; for if they gathered it sooner, it was not so Mature, and if afterward, some of its *Vertue* expired; and the quantity of the Juice was less, because dry'd up in some measure, if not taken timely.

2. *They made several Incisions in every Poppy's Head*, to have the greater Plenty of Juice.

3. *They made them immediately after the Dew was up*, to prevent its being tainted with any of the Dew; and because the great Heat of the Day, in those Countreys, would much diminish the Quantity of the *Milky Juice*, and so thicken it, that it would not run out as freely as in the *Mornings*.

4. *They made the Incisions transversely*, thereby to cut and lay open more of the *Milky Vessels*.

5. *They made them somewhat obliquely*, that the Drops might the better follow, and overtake one the other, and thereby coalesce, and grow more considerable in Bulk, and that the oblique Wound might the better conduct them into the same part of the *Shells*; that they might find all together in a mass, when it was sufficiently dried or inspissated by the Heat of the Sun.

6. *They did not make the Incisions quite through*, (if they could avoid it) lest any of the Juice should run into the Cavity of the Head, and so be lost among the Seeds contain'd therein.

7. *They*

of Opium Reveal'd.

3

7. They sloped the Edge of the Knife, or Instrument, upwards, as they made the Incisions, that the Juice might the easier slide outwardly; especially in case they happened to make the Incisions quite through, which they could not always avoid, notwithstanding all the Care they used.

8. They went backward as they did it, to avoid going by the Shells, and incised Heads; lest they should disorder, or discompose, or throw them down, or wipe off any of the Juice with their Cloaths.

This being done, they left the Milky Juice in the Shells, to inspissate by the Heat of the Sun into a Pilular Consistence. I have been the more particular, to shew Men how to make Opium of English Poppies, which you'll find of good use.

The Milky Juice, as it dry'd or thickened, did gradually change its colour from white to a kind of a reddish yellow (or tawny) colour, not unlike, that of a Lyon's Hair, which colour you may still observe on the inside of our common Opium, when rudely torn by force, if taken notice of upon the tearing; for the Air does soon blacken it.

This sort of Opium gathered in Shells, &c. (as is aforesaid) the Grecians (our Masters in Physick, from whom we derive the Names of many of our Medicaments, Diseases, &c.) called Ὠπῖον , which signifies the Juice, by way of Eminence; as we call the Jesuits Bark (the Bark) because most useful, and excellent.

The Latines, who had also their Learning, and Words of Art, from the Grecians, called it Opium from Ὠπῖον ; it being usual with them in very many Cases, particularly in things made out of other Matter (as Opium is made out of Ὠπῖον the Juice) to change *os* to *um* or *ium*, so that Ὠπῖον (or *Opos*) was by them call'd Opium.

The *Latines* becoming *Masters* of the World, and of every Thing that was good and excellent; and all People observing their *Manners*, *Fashions*, *Usages*, &c. some of the *Eastern People* got the *Use* and Name of *Opium* from the *Latines*, which they in Process of Time called *Ofium*, by changing π (or *pi*) into *fi*; which is very common in all *Nations*, because the *natural Pursuit* of *Ease*, and *Pleasure*, in the Run of *Discourse*, changes the *harder*, and *harsher sounds*, into such as are *easier*, and *sweeter*, when they are *like* in sound, as *pi* and *fi* are. The Sound of π (or *pi*) is harder than that of *fi*; 1. Because it quite stops the *Breath*, which the sound of *fi* does not. 2. Because the sound of π (or *p*) requires the motion of the *Lower Lip* upward, against its *natural gravity*, and the motion of the whole *Lower Jaw* upward, by consent, to help that of the *Lip*; whereas in forming the sound of *f*, the *Lower Lip* moves only *horizontally*; which is the easiest of *Motions*, except the *Natural motion* of *weighty Things downward*, or *light Things upwards*; yet are both those Sounds *like* in their *formation* in several other *respects*; as 1. Because both are *non-vocalized Sounds*. 2. Both are *labial*. 3. The *Tongue* lies still in its *Natural Position* in forming both. 4. The *Uvula Valve*, which shuts up the *Passage* of the *Breath* through the *Nose*, is shut in forming both; all which shews, that the sound of π (or *p*) π (or *pi*) is much *harder* to be form'd than that of *f* (or *fi*) and yet considerably *like*; which is the true Cause why all *Nations* are apt to change the harder sound of *pi* into the *easier* and *like Sound* of *fi* (or of *p* into that of *f*): I put *pi* and *fi* for *Instance*, because the *Likeness* appears better in them by having the same *Vowel* after both; whereas when you say *p* (or *pee*) *f* (or *ef*) the *Difference* of the *Vowels* added, and the sound of

of Opium Reveal'd.

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of *ee* put after *p*, and of *e* before *f*, (to help the Consonants to sound) makes them seem unlike, by reason of the different *Vowels*, so differently placed; whereas *pi* and *fi*, having the same *Vowel* alike placed after them, do truly shew their *likeness* without *confusion*. It is by Reason of this *Likeness*,

That { *Sapphick*, } Are founded { *Saf-sick*.
 { *Sapphirc*, } { *Saf-fire*, or *Safre*.
 &c.

That *Τροπαιον* is Translated *Trophæum* (or *Trofaum*) a *Trophy*.

Besides, that the *Arabians* did and do very commonly change *p* to *f*,

Saying { *Faunia*, } For { *Poeonia*.
 { *Ofium*, } { *Opium*.
 &c. *&c.*

And this *likeness* of the Sound of *p* and *f*, is the Reason why *pb* is written for *f*, because *b* signifies the sound of *Breath* expired, which if you use upon sounding *p*, it will be the sound of *f*; so that *f* is a kind of a breathing *p*, that is *pb*.

Of which Matter, the Curious in such Things may find more to their satisfaction in my *Phonography*, when published, which, I hope, will be suddenly, if not before this Book.

They call it, in some of the *Eastern Countries*, *Affium*, or *Affion*, instead of *Ofium*, it being usual in all *Countries* to change the *harder*, and *harsher* sound of *o*, to that of *a*, which is like it, but *easier* and *sweeter*. It is hence,

B 3

That

That we are apt to say $\left\{ \begin{array}{l} \text{Carat,} \\ \text{Fagat,} \\ \text{Flagan,} \\ \text{Wagan,} \\ \text{\&c.} \end{array} \right\}$ For $\left\{ \begin{array}{l} \text{Carot,} \\ \text{Fagot,} \\ \text{Flagon,} \\ \text{Wagon,} \\ \text{\&c.} \end{array} \right\}$

Changing the Sound of *o* to that of *a*; because the Sound of *a* is easier, and not unlike that of *o* (as was said.)

Some in those Parts call it *Amphion*, (or *Am-pion*) for like *Reasons*, all (doubtless) deriving the *Names*, that I have mentioned, from the *Greek Word* Ὀπῶν, the *Latines* saying *Opium*, (whence we have it) the *Arabians* *Ofium*, and some other *Eastern People* *Afium*, or *Affium*, and others *Amphion*, &c.

The best *Opium*, that was in Use in those *ancient Times*, was had from *Thebes*, the *Chief Town* (or *City*) of the *Country of Thebais* in *Egypt*, (not *Thebes* in *Boeotia*, or *Cicilia*) which is now called *Thebes*; Because, as *p* is apt to take the sound of *f*, so *p* and *b* are much more apt to take the sound of *v*, which is (as it were) a sweeter sort of *f*, with which it exactly agrees in its formation, but that the sound of *v* is vocalized, (which sweetens it) and that of *f* is not. It is from the aptitude of the sound of *b* and *p*, to change into the most sweet sound of *v*,

1. That Children say, *Marvel* for *Murble*, &c.

2. That *b* or *β* in $\left\{ \begin{array}{l} \text{Ebur,} \\ \text{Guberno,} \\ \text{Δαβιδ,} \\ \text{Βεδω,} \\ \text{Βιργιλιο,} \\ \text{Βαρρων,} \\ \text{Βιου,} \end{array} \right\}$ Is translated to $\left\{ \begin{array}{l} \text{Ivory.} \\ \text{Govern.} \\ \text{David,} \\ \text{Vado.} \\ \text{Virgilius.} \\ \text{Varro.} \\ \text{Vita.} \end{array} \right\}$

3. That

3. That p in $\left\{ \begin{array}{l} \text{Sapor,} \\ \text{Papilio,} \\ \text{Præpositus,} \end{array} \right\}$ Is translated to $\left\{ \begin{array}{l} \text{Savour.} \\ \text{Pavilion.} \\ \text{Provost.} \end{array} \right\}$ v in

Which changing of b and p to v , must doubtless happen in other *Languages*, as well as those I mentioned, because the sound of v is so much easier, and sweeter, than either; yet like them in sound.

But the sound of b is more like that of v , because the sound of both are *vocalized*, which that of p (as has been said) is not; so that b and v agree exactly as p and f ; This makes the *Egyptians* say *Theves* for *Thebes*, as the *Arabians* say *Ofium* for *Opium*.

Who knows, but this may be the cause why P is a kind of shut F , and F a kind of an open P ; for suppose P opened at the round part, to signify that the Lips are not closed in sounding F , and that the lower stroak or part be left shorter, to signify that the lower Lip is drawn inward in sounding F , the P becomes a perfect F .

The *Reasons* why the *Opium*, that came from *Thebes*, (now called *Theves*) was, and is the best, are, 1. That *Thebes* (or *Theves*) being in *Egypt*, lies in a hotter Country, that is, nearer the *Line* (or *Equator*) than any of the Countries on the North-side of the *Mediterranean*; for it is observed, that the *Heat* of *Climates* contributes very much to the *Strength* of *Opium*, which is weaker if you make it in *England* or *Germany*, than in *France*; in the Northern Parts of *France*, than in *Languedoc*, which borders upon the *Mediterranean*; and weaker there than in *Smirna*, *Natolia*, *Aleppo*,

and *Apulia*, which are more Southern ; and weaker in those Places than in *Thebais* in *Egypt* : For which cause we may Judge, that the *Opium* which comes to *England* from the *East-Indies*, that is yet hotter than *Egypt*, being much worse than that of *Thebes*, (or *Thebes*) must in all probability be adulterated, or made of the *Leaves* and *Stems* of the *Poppy*, (as some say) otherwise it would be rather better, as coming from the hotter Country. 2. That of *Thebes* may be better, because the Heat of *Egypt* is more constant, and uniform, than in *Natolia*, *Aleppo*, *Smirna*, &c.

The Quantity of *Opium* which was gathered by the *Milky Juice* of the *Poppy's Heads*, dropping into *Shells* out of the *Incisions* aforelaid, being but small ; and the Use of this most noble, pleasing, and generous of *Cordials*, and *Medicaments*, daily increasing, by the constant and infallible Benefit they found thereby ; Men, partly to avoid the tediousness of gathering it by *Drops*, and partly out of necessity, but mainly ('tis to be doubted) out of covetousness, began to bruise and pound the *Poppy's Heads*, and to squeeze out the Juice, for Expedition and Quantities sake ; which bruising, and squeezing, caused it to look blackish.

This the *Greeks*, for Distinction's sake, called *Μηκόνιον*, from the Word *Μήκων*, which signifies *Poppy* ; still calling the better sort, which was gathered in *Shells* out of the *Incisions* of the *Poppy's Heads*, *Ὀπιο*.

Thus have you the true Original of *Ὀπιο*, and *Μηκόνιον*, which the *Latines* (and we from them) call *Opium*, and *Meconium* ; Tho' (as it happens in most Things in Merchandise, to recommend the Goods) we now call the *Meconium*, *Opium*, by the better Name, as they do in another case (out of abundance of absurd Civility) call every *Quack* a *Doctor*.

After.

of Opium Reveal'd. 9

Afterward (its *Use* growing more and more) they added the *Leaves* to the *Poppy's Heads* in the pounding, bruizing, and expressing the *Juice*, boiling it for speed's sake to the consistence of a *Confection*; which cooling, comes to the consistence that we have it in (I mean the fresher and softer sort that we have) which by the forcible pounding, squeezing, and boiling, contracts a blackish Colour like that of *Horse-Aloes* on the out-side, to which Colour the *Air* does very much contribute, and pressing the Superficies close together; for if you rudely tear a piece of that we have (which is all of this last kind) it looks at first (as was said) of a reddish Yellow; but the *Air*, especially if moist, or any *Moisture*, and handling of it, and closing the Superficies together, soon makes it look blackish again. This (as was intimated) is that we now call *Opium*, and have in common *Use*.

Which being also in common *Use* among the *Grecians* when the *Turks* Conquer'd them, was by the *Grecians* themselves called *Pous* (or *Pos* with the *o* mouthed widely) which came doubtlessly from $\text{O}\pi\text{O}$; the *Meconium* at last gaining the better Name of $\text{O}\pi\text{O}$ (or *Pous* or *Pos*) after the manner aforesaid to recommend it (as all *Opium* is now call'd *Theban*) and the *O* in the beginning of $\text{O}\pi\text{O}$, passed over in the Run of Discourse, which is not uncommon with *Vowels*, because of their flat Sound, which is so by reason of the wide Passage that the *Breath* has between the *Tongue* and the *Palate* in the Formation thereof; for *Wideness* of Passage is the cause of *Flatness*; as *Narrowness* (in *Birds*, *Children*, &c.) is the cause of *Sharpness* of Sound; therefore the Sound of *Vowels* being flat, fading, and consequently not as much missed as sharper Sounds, we often omit *Vowels*, particularly in the beginning of *Words*, for *Ease* and *Shortness* sake. Thus it comes to pass,

That

That Men say {	{ Potbecary	} For {	{ Apothecary.
	{ Prentice		{ Apprentice.
	{ Buttals		{ Abuttals.
	{ Larum		{ Alarum.
	{ Light		{ Alight.
	{ Pos (or P _{ss})		{ OπΘ

And as OπΘ came to be founded Pos, so Pos (as naturally) to be founded P_{ss} (or P_{ous}) because it is easier to found *u* after *o* in this and some other cases, than to omit it, as it is easier to found *p* between *m* and *t* &c. than not; as in *tempt*, *crumpt*, *limpt*, &c. which are more easily so founded, than if the found of *p* were left out, which I call *Easiness* of *Consequence*. Hence it is

That {	{ Bold	} Are founded {	{ Bould.
	{ Sold		{ Sould.
	{ Hold		{ Hould.
	{ Bolt		{ Boul.
	{ Foll		{ Joul.
	{ Toll &c.		{ Toul. &c.

Changing the *o* into *ou*, as the *Grecians* did *Pos* to *Pous*. For this and such reasons it is, that the *National Greek* can hardly be understood by *Scholars*, when spoken by the *Natives*.

It is for the same Reason, that the *Greeks* write *Greek*, (as we do *English*, and the *French* do their *Language*) different from what they speak; so that if any Man should learn *French*, or *English*, and always found it as it is *writ*, or *printed*, he would very hardly understand them, as they are vulgarly *spoken*; which is the very Case of such as learn *Greek* by *Book*, who always found every Letter,

of Opium Reveal'd.

II

Letter, whereas the *Native Greeks* do (what all Nations do more or less) shorten, and alter the Sound of Words in the Common Run of Discourse by a natural Propensity unto, and Pursuit of *Ease, Pleasure, and Speed*, which by degrees very much alters the Sound of Words.

The *Turks* having been used to call the better Sort, that dropt out of the *Incisions* made in the *Poppy Heads*, *Maslack*, continued that Name to that Sort after they Conquer'd *Greece*, and call'd the other Sort, which they found in Use among the *Grecians* by the Name that the *Grecians* gave it, *viz. Pous*; and such as commonly use it they call *Poussi* by way of Contempt, as if we should say *Small beer-Drinkers*, in comparison of *Wine-Drinkers*.

You may easily perceive by what has been said, *Why* our *Opium* hath so much Filth in it.

Why it tastes sometimes of an *Empyreum*, or *Burning*, in not stirring it well while it is boiling into a *Consistence*, and not giving it only a gentle Heat when it begins to thicken, gradually lessening the Fire, or letting it conveniently decay, and go out of it self; which is a very good Way for such as have not other Conveniences; for as the Matter thickens, the *Heat* declines, and so becomes safe from a Taste of *Burning*, if the Fire be duly proportion'd; But all this *Trouble* is avoided by inspissating by the *Heat* of the Sun, which is used in some Countries.

Note, That the *Poppy* of which *Opium* is made, in all *Turky, Egypt, Thebes, &c.* is the great *White Poppy*, which grows very freely in those Parts, and (as I am inform'd) without any manuring of the Ground in some Places; certain it is, that they now have whole *Fields* of that *White Poppy*, out of which they make the *Opium*, as is aforesaid, by *pounding, pressing, boiling, &c.*

CHAP,

C H A P. II.

Of the Election (or Choice) of Opium.

ALL *Opium* being made in ancient Times by the *Milky Drops* that fell out of the *Incisions* mention'd in the last Chapter, which being a natural and simple way, made no difference in the *Opium*, but what Nature it self did; all their Knowledge of the best *Opium* consisted in distinguishing the *Theban* from other *Opium*, which was not naturally so good.

1. *Theban Opium* was of a lighter *Reddish Yellow* than other sorts, therefore some call'd it *White Opium*, not that it was absolutely white, but only relatively such in comparison with other kinds of *Opium*; as we say *White Resin*, in respect of other *Resin*, tho' it is not *white*, but only lighter coloured than other *Resins*.

2. *Theban Opium* was most hot, bitter, and biting in taste, from whence you may infer, that the *Opium* which has those qualities in the highest degree is the best.

3. It smelled rankly, and vehemently of the *Poppy*, which gives you another good sign to judge of *Opium*.

4. It burnt with a clearer Flame than any other.

5. Some say, that it was weightier than other sorts. Notwithstanding all which Differences, they did in time find ways to adulterate it, which were these:

1. They adulterated it with Juice of *Glauciam*, (or *Apple of Love*.)

This

of Opium Reveal'd. 13

This was discernable by the *Yellow Tincture*, that it gave to *Water*, and other *Menstruums*; whereas the *Theban*, and all true *Opium* gives a *Red Tincture*.

2. It was counterfeited with *resinous Things*.

This Cheat was discoverable by its not being uniform, nor so dissolvable in *Water* as good *Opium*.

3. It was mix'd with Juice of *Lactuca Sylvestris*, or *Wild Endive leav'd Lettuce*.

This made it of a duller colour, and not to smell so perfectly and rankly of the *Poppy*.

4. It was sometimes mix'd with the *Milky Juice* of *Spurge*, which being *hot*, *bitter*, and *biting*, was hardly discernable, but by its purging and disturbing quality, and somewhat less and different.

You may be sure, that *this*, and all the other *Mixtures* lessen'd its *Vertue* as an *Opiate*, if considered in the same quantity, because they must take up room in the *Mass*; but *Lactuca Sylvestris* being of the nature of *Opium*, made the loss of its *Vertue* less discernable.

It is true, that we have none of the *Opium* that was gathered by the *milky Drops* out of the *Inci-sions*; and therefore what is said, doth not much concern us as to that sort; however these *Observations* will enlighten us as to the *Opium* that we now have.

Of which I cannot find, that there is much *Adulteration* used, because (I suppose) that it is now grown considerably cheaper, by reason of the vast quantities that is made, with so much ease, that it is not worth while to counterfeit it, there being now great Fields of *Poppy* in *Turky*; so that our business will be rather to distinguish the *Sort*, than the *Adulteration*; tho' this shall not pass unregarded, as far as it may concern us.

There

There are two sorts brought over to us; *one* from *Persia* and the *East-Indies*; the *other* from *Turky*, as from *Lesser Asia*, (or *Natolia*) *Smyrna*, *Aleppo*, &c.

I. That which is brought from *East-India*, *Persia*, *Surat*, &c. is (as I am inform'd) made of the *Leaves* and *Stems* of the *Poppy*, and is,

1. More full of *Filth* within it, (for the outside is not so much to be regarded, because of *Accidents*.)

2. It is not so *uniform*, *smooth*, and *supple*, but *harsh* and *rugged*.

3. It is not so readily dissolvable in *Water*.

4. The *Indian* is brought over in *larger Pieces*.

5. It is not brought so wrapt in *Leaves* as the *Turky Opium* is.

Bontius says, that they make it of the *Stems* and *Leaves*; if so, it must be much worse than the *Turky Opium*, that is made of the *Heads* and *Leaves*.

II. Among those sorts that are brought out of *Turky*, (and indeed any sorts of *Opium*)

1. That is best that is most *bitter*, *hot*, and *biting*.

2. The *lighter*, *whiter*, and clearer its *Flame* is, when it burns, the better it is.

3. The more *uniform*, *even*, *smooth*, *tough*, *yielding*, and *complying* it is to be wrought, or brought to any *form*, the better it is.

4. The more it gives, upon, or against moist *Weather*, or in a moist *Air* of any kind, and the better, speedier, freer, and more perfectly it dissolves in *Water*, the better it is.

5. The redder the *Tincture* is that it gives in *Water*, *Spirit of Wine*, or any *Menstruum*, the better it is; and 'tis never good if it gives only a *yellow Tincture*.

of Opium Reveal'd.

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But Note, That even the best *Opium*, if you take but a very slight *Tincture* thereof, will appear yellowish, especially in a *white Vessel*. Therefore my meaning is, that the redder *Tincture Opium* causes in *Water*, quantity for quantity, the better it is.

6. It should have no taste or smell of an *Empyreum*, or Burning; for that gives it a nauseous taste, and in some measure signifies a loss of its Vertue by burning, tho' this may be inconsiderable.

7. The less Filth it has on the inside, the better it is.

8. The more it sparkles when cut, and afterward breath'd upon three or four times, the truer is the *Opium*; for those sparkling Particles are its noble *Volatile Salt*, (or *Sal-Volatile-oleosum*) and not its resinous Parts, as *Wedelcus*, and others affirm.

1. Because when the *Rosin* and *Volatile Salt* are separated, that sparkling follows the *Volatile Parts* and not the *Rosin*, wherein they do not appear in the least. 2. Because I find that they are the Parts that are most apt to dissolve in *Water*, which the *Rosin* is not. 3. Because they are much altered by a warm and moist *Breath*, which the resinous Part is not. 4. How could that *Opium* be the best (as 'tis found to be) that has most of them, if it were the *Rosin*, which is the worst Part of *Opium*? But 'tis highly consonant to *Experience*, that they should be the *Volatile*, or best Parts of *Opium*, which is so much the better, the more it abounds with them.

9. If it yields any other *Tincture* than *Red*, it is not right; and the daller, or paler the *Red* is, the worse or weaker it is.

10. The best is heavier in proportion to its Bulk, which you may soon experiment thus:

Weigh

Weigh an *Ounce* of each in the *Air*, then weigh them (just as they are) in the *Brass Scales* in *Water*, and the heavier will out-weigh the other in *Water*; for the heavier any thing is, the less *Water* takes from its *Weight* in proportion to its *Bulk*; this is an infallible, and most ready way to know the *Weight* of any thing in proportion to its *Bulk*.

Note, That my *Discourse* is most particularly concerning the best sort of *Crude Turkey Opium*; that is the best that we have in common *Use*, and that its *Effects* and not those of any *Preparation* thereof, are set down in the following *Chapters*.

CHAP III.

The Effects of Opium used externally.

OPIUM used externally has two sorts of Effects upon a Humane Body: 1. As, an Opiate to cause Sleep, take away Pain, &c. 2. As an Alterative of the Parts it is applied to.

I. *As an Opiate:* It is of very uncertain and uneven Effects, when applied externally; for sometimes it causes Sleep, takes away Pain; but it often fails; therefore it is generally much better, safer, more certain, and effectual, to use it internally. I do scarce know the case wherein 'tis better to use it externally than internally, unless it be to smell to in some cases: But of these Things, more particularly, when we come to the Use of Opium in Curing, Preventing, or Paliating Diseases; for here we only lay down Effects, in order to a Disquisition of the Cause of the Operation of Opium, to which its internal Effects will mainly contribute; however, it may be very useful to that end, to lay down its alterative Effects, for thereby we shall in good measure know the Principles by which it operates.

II. Its external Effects, as an Alterative, are these, viz.

1. It incides, resolves, and discusses.
2. It relaxes and mollifies.
3. It maturates and suppurates.
4. It exulcerates, or causes Blisters, if it be very strong, and applied to Persons of a fine Texture,

C

where

where the Skin is tender ; but this *Effect* belongs more properly to the *Maslack*, or true *Op^o*, that drops from the *Incisions* made in the *Heads* of the *Poppies*, especially the *Theban*, which affords a very powerful Juice. Hence you may observe, that the more it *exulcerates*, or *blisters*, the better is the *Opium*, & *vice versa*.

5. It is a *Psilotherick*, for it prevents Hair to grow, and causes the shedding thereof.

6. It is hurtful to the *Eyes* and *Ears*.

7. It excites *Itchings*, applied (in a moderate manner) to the Skin.

8. It excites *Venery*, applied to the *Perinaeum*.

C H A P. IV.

The Effects of Opium used Internally, in a moderate Dose.

1. **T**HE moderate Dose in ordinary Use, to produce the following Effects, is from one to three Grains, (more or less) according to the Circumstance, Condition, Case, Constitution, Age, &c. of the Person who takes it.

2. It operates generally in a short time after it is in the Stomach, that is, in about half an Hour, (more or less) if taken in a liquid Form; and in about an Hour (more or less) if in a solid Form, drinking a Draught of Water, or some Liquor, after it; otherwise it may be sometimes near an Hour and a half before it has its full Effect. But the time of its Operation has a considerable Latitude, according to the Disposition of the Stomach, and other Circumstances, as the Vehicle it is taken in, &c.

*The constant Effects of Opium, used internally
in a moderate Dose.*

1. It causes a most agreeable, pleasant, and charming Sensation about the Region of the Stomach, which if one lies, or sits still, diffuses it self in a kind of indefinite manner, seizing one not unlike the gentle, sweet *Deliquium* that we find upon our entrance into a most agreeable *Slumber*, which, upon yielding to it, generally ends in *Sleep*: But if the Person keeps himself in *Action*, *Discourse*, or *Business*, it seems (especially when given in a *Morning*, after a moderate Rest at Night) like a most delicious and extraordinary *Refreshment* of the Spirits upon very good News, or any other great cause of Joy, as the sight of a dearly-beloved Person, &c. thought to have been lost at Sea, or the like, causing such a pleasant *Ovation* of the Spirits, *Serenity*, &c. as we find after a competent Measure of generous Wine ad *Hilaritatem*, (as Men use to say.)

It is indeed so unexpressibly fine and sweet a Pleasure, that it is very difficult for me to describe, or any to conceive it, but such as actually feel it; for 'tis as if a *Good Genius* possessed, or informed a Man; therefore People do commonly call it a heavenly Condition, as if no worldly Pleasure was to be compar'd with it: *Helmontianus* would doubtless express it by the *Archeus* in his very best Humour.

It has been compar'd (not without good cause) to a permanent gentle Degree of that Pleasure, which Modesty forbids the naming of; and 'tis well worth a Remark, that both are Pleasures of the same Sense, viz. that of Feeling; for it cannot be a Pleasure of any other Sense, since it is internal.

2. It causes a brisk, gay, and good Humour: Nor do I doubt but it has this Effect upon sleeping Persons, as far as their Condition is capable of observing it; for you shall have them often tell of pleasant Dreams after it, when they remember them, and speak of any. See *Bauchin*, and the Authors mentioned below under the 4th Effect of Opium.

3. It causes Promptitude, Serenity, Alacrity, and Expediteness in Dispatching and Managing of Business: To which end, and that of a good and gay Humour (which are near of kind) it is commonly taken in the Morning in the Eastern Countries, with most certain Effect.

The truth of which *Wedelius* is forced to confess, though quite contrary to his Hypothesis of Opium's fixing and coagulating the Spirits; giving an instance of "a certain serene Person, who when she had any Affair of great moment to dispatch, did (before-hand) take Opium with great advantage; for she thereby found her self every way better disposed for Business, and more enabled to bear the Fatigue thereof. Which is the Substance of what he writes in Latin.

Many other Authors confirm the Truth of these Effects; but (above all) the constant Experience of the Eastern Nations, puts it out of all doubt.

4. It causes Assurance, Ovation of the Spirits, Courage, Contempt of Danger, and Magnanimity, much after the manner that generous Wine does; instead of which, the Turks, &c. use Opium before Engagements, desperate Attacks, &c. (as is most notorious) to make them Courageous, which it certainly does: For your satisfaction as to this, and other Effects of Opium, not so commonly observed with us, for Reasons given in Chap. VIII. See *Belonius*, l. 3. c. 15. p. 179. *Erastus Disp. de Sapor.* p. 65. *Georg. Andreae Itenerar. Ind.* l. 2. c. 9. p. 12. *Camerar. Oper. Subcis.* l. 1. c. 93. p. 437. *Erastus Disp. de Nat.*

cot. Oberndorf. Historians also add, That when the Great Turk makes a considerable War, the Soldiers buy up all or most of the Opium; which may be worth a Merchant's Observation; for it thereupon grows dear, and is much cheaper in times of Peace.

5. It prevents and takes away Grief, Fear, Anxieties, Peevishness, Fretfulness, &c. These are necessary Consequences of the former Effects.

6. It causes Euphory, or easie undergoing of all Labour, Journeys, &c. and that far beyond all Wines and hot Cordials, or Spirits; therefore it is very much used in Turkey and the Eastern Countries, in laborious Undertakings, great Journeys, &c. which Men perform by the help of Opium, after a prodigious and almost incredible manner: But the Matter of Fact is so common and usual, that there is no place of doubt; besides, that some who tried it among us, have found it so.

7. It lulls, soothes, and (as it were) charms the Mind with Satisfaction, Acquiescence, Contentation, Equanimity, &c. How should it fail to cause these Effects, since it causes all the former gay, pleasant, and brave Humours?

Dr. Willis, and others, having no true Experience, or Knowledge, of Opium, imagined that it caused Courage, Bravery, Equanimity, &c. by stupifying the Senses, Brain, &c. making People inadvertent, dull, and inapprehensive; which is a great Mistake, and a groundless Conceit; for it is a most certain Truth (which millions can affirm) that it produces those Effects by an Ovation and Pleasure of the sensitive Soul and Spirits, as generous Wine does before Men are fuddled, or overcome with it; How else could they at the same time be more serene, and apt for the Management of any Business, and neat Dispatch of Affairs, as it is most certain they are? These fundamental Mistakes about Opium, have been

been (as you'll find hereafter) one great cause why its Operations have puzzled and quite baffled all Enquirers.

8. It quiets, allays, and composes all Perturbations and Commotions of the Spirits, (or sensitive Soul) Bloud, Humours, &c. as in Hysterical Cases, Diary Fevers, that proceed from Passions; as, Anger, Grief, Terrours, &c. from violent Motion, Labour, Heat, Journeys, Convulsions, &c. or from Pain; and stops Bleedings that proceed from such Commotions.

9. It causes a Relaxation of all the sensible Parts of the Body, as the Membranous and Nervous: This is notorious by its Effects, as causing Perspiration, Sweat, Relaxation of Sphincters, Dilatation of the Pupil of the Eye, Relaxation of the Cornea, and all other Effects of Relaxation, as you'll find more particularly hereafter.

10. It causes Indolence, or exemption from Pain, (as all know and allow) and that when Sleep does not intervene.

11. It stops, moderates, cures, or palliates all Fluxes, excepting those by the Pores, or such as depend (as that does) upon Relaxation, as when Sphincters are weak, or paralytical; but these last are unnatural Accidents.

12. It mightily promotes insensible Perspiration.

13. It prevents Shiverings in Ague-Fits, and such-like Cases, if given in due time and quantity, which shall be shown in the Curative Part.

14. It prevents and cures Colds.

15. It causes a larger and slower Pulse, supposing no accidental Cause to the contrary.

16. It causes Driness in the Mouth.

17. It has most Effect in warm and moist Weather.

18. It has more Effect upon lax and fine textured Persons, as Women, Children, &c. therefore Women seldom use it in Turkey, and the other Eastern

Countries ; where it is commonly used by the Men.

19. It causes an Efflorescence of the Skin, barring Accidents of Cold, &c.

20. It is observed by all, that it mainly affects the Genus Nervosum, and animal Spirits, and not the Bloud and Humors.

21. It increases Seed in some measure.

22. It causes a great promptitude to Venery, Erections, &c. especially if the Dose be larger than ordinary ; which I would have Men believe without experimenting it ; not that I fear to be confuted, but lest any should injure themselves by too great a Dose.

This is one great Cause (if not the chief) why the Infidels of Turkey, and the Eastern Nations (especially where Poligamy is allow'd, as among the Turks, &c.) use Opium so much, it never failing to produce this Effect in hale and healthy People, if the Dose be sufficient ; as is too notorious in all (or most) Countries from Greece to Japan inclusively, who use Opium for that end.

But as to the Truth of this Effect of Opium, not only Authors, and all the People of those Eastern Nations, but several Merchants, Factors, and Travellers, now living in London, can attest, That it is used, for that purpose, in those Countries with Effect ; yea, some in our own Nation, that use Opium in large Doses, can attest the same, upon Experience in their own Bodies. Those who desire to be satisfied, may also read Job. Jacob Saar. his Itinerar. Ind. p. 11. Olearius's Itinerar. Persic. l. 5. c. 15. & 18. B. D. D. Sacks, Tom. 11. Ephr. German. Obs. 69. p. 126. Bauchin, p. 450. Cardanus, Scalliger, Nich. Monordei, Fogelius de Turcarum Nepenthe, Bellonius, and others ; whose Words I do not repeat, partly for Modesty's, partly for Brevity's sake.

of Opium *Reveal'd.* 25

It does (I confess) look like a *Riddle*, that a most relaxing and stupifying *Medicament*, which takes away much of the Sense of *Feeling*, (and consequently *Irritations* to *Venery*, as one would think) should notwithstanding *irritate* thereunto, cause *Erections*, &c. however, it is most certain, tho' a seeming *Contradiction*, of which sort you have many more among the *Effects* of *Opium*.

Usual and frequent (tho' not constant) Effects of Opium, used internally in a moderate Dose.

1. *Sleep*, which is so far from being a *constant Effect* of *Opium*, that it will in me, and many other Persons, prevent *Sleeping*, even when otherwise inclin'd to it.

2. *Pleasant Dreams.*

3. *Stopping of Vomittings.*

4. *Stilling the Hiccough.*

5. *Taking off Convulsions and Contractions.*

6. *Causing Meat to stay long at Stomach.*

7. *Moderation, and prevention of Hunger.*

8. *Sweat.*

9. *The Flowing of the Menses*, tho' not observed by vulgar Physicians.

10. *The Flowing of the Lochia*, which is as little observed.

11. *Voiding of the Stone.*

12. *Delivery of Women.*

13. *Deadness of the Eyes*, as you see in *Drunkenness*.

14. *Dilatation of the Pupil.*

15. *Growth of the Breasts, Penis, and Increase of Milk.*

16. *Venereal Dreams.*

17. *Nocturnal Pollutions.*

18. *Itch.*

18. *Itchings in the Skin.*
19. *Much Urine.*
20. *Nausea.*
21. *Swimmings in the Head.*
22. *Watching.*
23. *A kind of dubious State, between sleeping and waking.*
24. *It stops Hemorrhages in many cases.*

Many more *Instances* of this *kind* might be given of its frequent and usual *Effects* in *Diseases*; but it would be *endless* and *needless*, since we have mentioned the *Prime, General, and Fundamental Effects*, upon which all such do depend, and that the particular *Enumeration* of its *Effects* in *Diseases*, belongs to its *curative* and *palliative Virtue*, which will be handled hereafter.

The rare Effects of Opium, taken in a moderate Dose.

1. *Temporary Palsies, as of the Bladder, and sometimes of other Parts, tho' very rarely.*
2. *Faltring of the Tongue.*
3. *Looseness of the lower Jaw, as in the Drowsie, Drunkards, &c.*
4. *Prevention of Sweat, in such as sweat too much for want of Perspiration.*
5. *Abortion.*
6. *Prevention of Abortion in some Cases.*
7. *Intumescence of the Lips.*
8. *Curing of the Dropsie, of which Dr. Willis gives an Instance.*
9. *Curing of Stupors of some sorts, as those from Colds, &c.*
10. *Anxieties and Distresses.*
11. *Vomitings and Hiccoughs.*
12. *Convulsions.*

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13. *Syncope, Leiptimies, and Faintings.*
14. *Death, tho' very rarely, and that in very weak People.*
15. *Purging.*
16. *Raising and reviving some Persons that are just expiring.*
17. *A long stay thereof at Stomach sometimes.*
18. *Stoppage of Urine.*
19. *It sometimes proves dangerous after Hemorrhages and large Evacuations.*

1. Note, That the first Class of Effects being the most constant, are the most proper, genuine, and principal Effects, upon which all other Effects depend, unless they are accidental: It must therefore be, that these should best guide us in the Disquisition of the Cause of the Operation of Opium.

2. Note, That the second Class, tho' not so constant, are natural Effects of Opium, and will be also good Guide for the same purpose.

3. Note, That there is but little notice to be taken of the rare Effects for that purpose, because most accidental.

*The Effects of the going off (or declination)
of the Operation of Opium, taken internally
in a moderate Dose.*

1. *A general return of all the Diseases and Disorders that Opium palliated during its Operation; unless it happens that some are cured thereby; which (if they be) is generally by the Benefit of Sweat, or insensible Perspiration; as Colds, Pain from Wind, or Humours, that should have passed by the Pores; as in Coughs, Tooth-ach, &c. from Constriction of the Pores; or by composing the Fury of the Spirits, or Blood, which it very often (yea, generally) cures with one single Dose: But of these things, more in the Curative Part.*

2. *Sweat,*

2. *Sweat, tho' not constantly.*
 3. *Frequent making of Water, sometimes.*
 4. *A Loosness (sometimes) even when there was none before the giving of the Opium.*
 5. *Diseases, seeming worse than before the taking of it.*
 6. *A melancholy and sad Depression of Spirits.*
 7. *A narrow Pulse.*
 8. *Itching of the Skin.*
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CHAP. V.

The Effects of Opium taken in an Excessive Quantity.

1. **A** Heat at Stomach.
2. A sense of Weight at Stomach (sometimes.)
3. Gaity of Humour at first.
4. Sardonical Laughter afterward.
5. Laxity, and Debility of all Parts.
6. Alienation of the Mind.
7. Loss of Memory.
8. Darkeness of the Eyes.
9. Laxity of the Cornea.
10. Appearance of divers Colours.
11. Deadness of the Eyes to the View.
12. Faltering of the Tongue.
13. A Sopor.
14. A slow, and wide Pulse.
15. A high Colour.
16. Looseness of the Jaw, and Lips.
17. Intumescence of the Lips.
18. Difficulty of Breathing.
19. Fury, and Madness.
20. Venereal Fury.
21. Priapisms.
22. Violent Itchings.
23. Nauseas.
24. Swimmings in the Head.
25. Vertigo's.

As after Drinking a great Quantity of Wine in a short time.

- 26. *Vomitings.*
- 27. *Hiccoughs.*
- 28. *A turbulent Pulse.*
- 29. *Convulsions, and Cold Sweats.*
- 30. *Faintings and Leiptbymies.*
- 31. *Cold Breath.*
- 32. *Death.*

Such as escape it generally have,

- 33. *Plentiful Purging.*
- 34. *Sweats that smell of the Opium.*
- 35. *Violent Itchings in the Skin.*

1. *Note, That all these Effects do not happen to all, but some to one, and some to others.*

2. *That these Effects are greater, or less, according to the Dose, Constitution of the Person, and other Circumstances.*

3. *That they are most endanger'd thereby, that have a Lax, and fine Texture, and a weak Digestion.*

4. *That a Looseness upon it is a good sign.*

5. *That it affects some by making them Furious, (as Wine does) and others Stupid; Generally the Furious are most safe from danger of Death; But of these Things more hereafter (by God's Help.)*

C H A P. VI.

*The Effects of a long, and lavish Use of
Crude Opium.*

1. **R** Elaxation, and Weakness of all Parts.
2. Inhability, or Listlessness to do any thing, except it be while the Opium Operates.
3. Inhability, or Listlessness to get up in the Morning.
4. A dull, moapish, and heavy Disposition, (as in old Drunkards) except it be during the Operation of Opium.
5. Diminution of Appetite.
6. Weakness of Digestion.
7. Dropsies.
8. Decay of Parts.
9. Weakness of Memory.
10. Stooping in the Back.
11. Early Decrepiteness.
12. Shortness of Life.
13. Acrimony of Blood.
14. Inclinations to Venery.
15. Frequent Inclinations to make Water.
16. Priapisms, and frequent Erections.
17. Nocturnal Pollutions.

} As is obser-
vable in old
Drunkards.

The Effects of sudden Leaving off the Use of Opium, after a long, and lavish Use thereof.

1. Great, and even intolerable Distresses, Anxieties, and Depressions of Spirits, which in few days commonly end in a most miserable Death, attended with strange Agonies, unless Men return to the Use of Opium; which soon raises them again, and certainly restores them; if it has time to operate, before they die; which it soon does in a liquid Form. Or, if they have not Opium, or will not take it, they must use Wine very plentifully, and often, as a substitute to the Opium, tho' it doth not perform half as well as Opium.

2. A return of all Diseases, Pains, and Disasters, that were palliated by the taking of Opium.

3. Dangerous Loosenesses.

4. Death follows the leaving it off, after a very long, and lavish use thereof.

The Inconveniences of leaving off the Use of Opium, do bear a certain Proportion to the Time, and Quantity, that it has been used in.

1. Note, That the Turks do drink some Water always after the taking of Opium, as being the best Menstruum to dissolve it.

2. Note, That it is usual with them to take a Drachm in the Morning, and so much in the Afternoons, and so may we, as well as they, if used to it; and 'tis a very silly saying, that you'll find in Authors, That they are better able to bear it, because of the Climate, &c. whereas the more Northern Persons are better able to take it, than the Southern, as will hereafter appear most plainly.

I am

I am told of one near *Banbury*, that takes Two Ounces a Day.

3. *Note*, That among the *Effects* of *Opium* may be observed many *seeming Contradictions*, yet is there nothing more certain than the several different *Matters of Fact*; which (no doubt) has been a great Cause to puzzle the *World* about it, and to run Men into strange *Absurdities* concerning its Operation; and all to deviate so far from the Truth, that nothing in *Nature* can be farther, unless you'll say, that *Heat cools*, or what *pleases* the *sensitive Soul*, is at the same time *abhorr'd* by it.

Now, because these *seeming Contradictions* in the *Effects* of *Opium*, are the greatest *Rubs* to be met with, and that the *Reader* may take the better Estimate of the *Undertaking*, and my *Explication* of its *Effects*, when I come to it, I shall not fear to enumerate them distinctly, (tho' they will make the strangest *Catalogue of Riddles*, that ever was seen) trusting in Him, that created this wonderful *Medicament*, that he will enable me to explain all its *Effects*.

*The seeming Contradictions in the Effects of
Opium.*

1. It causes *Sleeping*, and *Watching*.
2. It causes, and prevents *Sweat*.
3. It relaxes, and stops *Loosenesses*.
4. It stops *Fluxes*, and causes that of *Sweat*, &c.
5. It stupifies the *Sense of Feeling*, yet irritates by that *Sense to Venery*.
6. It causes *Stupidity*, and *Promptitude* in *Business*; *Cloudiness*, and *Serenity* of *Mind*.
7. It excites the *Spirits*, and quiets them.
8. It is very hot, yet cools in *Fevers*.
9. It is hot, and bitter; yet lessens *Appetite*, even in *Cold Stomachs*.
10. It stops, and promotes *Urine*.
11. It relaxes, and weakens; yet enables us to undergo *Labours*, *Journeys*, &c.
12. It causes, and prevents *Abortions*.
13. It stops *Vomiting* above all things; yet causes most violent, tedious, and dangerous *Vomitings*.
14. It stops *Purging* in a most eminent manner; yet sometimes causes it.
15. It is very acrimonious, yet (as all say) ob-
tunds *Acrimony*; however, it allays *Pain* proceed-
ing from *Acrimony*.
16. It causes a furious *Madness*; yet composes the
Spirits above all things.
17. It causes *Dropsies*; yet sometimes cures them
(as *Willis* says.)
18. It causes *Palsies*; yet have I known it to
cure a *Palsie*.
19. It causes *Drinks* in the *Mouth*; yet takes off
Thirst in *Fevers*.
20. It cures, and causes a *Hiccough*.

of Opium *Reveal'd.* 35

21. It *stanches Blood*; yet causes the *Blood to come outward*, (as appears by the *Efflorescence*, or *Redness* of the Skin that it causes) yet *moves the Menses* and *Lochia*.

22. We have many Instances of it *promoting*, and *hindering Critical Motions*.

23. It *raises very weak People*, (when nothing besides will do it) yet it *kills other weak People*.

24. It *causes*, and *cures Convulsions*.

25. It *causes Relaxation*, and *Contraction* of the *same Parts*.

26. It *Relaxes*; yet *causes Rigidity*, *Tension*, and *Erection of the Penis*, *Priapisms*, &c.

Thus have I fairly, and faithfully, laid the whole *Onus* of the *Operations*, *Effects*, and *Contradictory Phenomena's* of *Opium*, upon my *Shoulders*; however I come off, and clear my self of the *Intricacy*, *Mazes*, and *cross Effects* thereof, by explaining them; which none upon the *View* thereof will think possible, and none before me durst as much as enumerate for that *End*.

C H A P. VII.

The Author contrives a Compendious Way of Examining all Opinions concerning the Operation of Opium.

HAVING, without any *sly* or *sordid Evasion*, or considerable *Omission*, (which has been the perfidious Course of *Authors* in this Case) fully and truly enumerated the *sensible* and *certain Effects* of *Opium* in *Humane Bodies*, and thereby empannel'd a *Just Jury* for the *Trial* of *Hypothesises*, which must be *Judged* by the *Effects* or *Phenomena's* of *Opium*; I will now proceed to their *Examination*. But because it would be endless to take every one particularly into *Consideration*, I will use their *Stratagem*, who *blow up Foundations*, to save the tedious *Pecking* at all the *Parts* of the *Superstructures*, which in this Case would require an *Age*, and take up all my *Time* in *demolishing* them, which may be better employ'd in *erecting* something that may be useful.

I have *considered*, and find, That the *Foundation*, in which all *Authors*, both *Ancient* and *Modern*, agree, and whereupon they have hitherto endeavour'd to build, (looking upon it as *firm* and *Warrantable* in all *Ages*) is this, *viz.*

That Opium operates by diminishing or disabling the Spirits (meaning the *animal Spirits*.)

The *Ancients* affirming, *That it did so by an extreme cold Quality, &c.* And

The

The Moderns (who observed it to act, while it is at *Stomach*, by affecting the *Brain*, *Nerves*, *Animal Spirits*, &c. and concluded no Action was perform'd without Contact) infer'd and agreed, (because no visible Passage could be found from the *Stomach* to the *Head*) that it must of absolute necessity act by *Fumes*, *Vapours*, *Auras*, or *Effluvia* sent up out of the *Stomach* to the *Brain*, *Nerves*, &c.

So that all the remaining Question among the Moderns is, Which Way those *Fumes* or *Vapours* do the Feat? all allowing the *Fumes* do it.

One saying, That they stuff the Pores of the *Brain*, and so hinder the Generation of *Animal Spirits*.

A Second, That they constringed, and closed the Pores together, thereby hindering the said Generation.

A Third, That they fix'd, and coagulated the *Animal Spirits*; as *Wedelius*, and others.

A Fourth, That they clouded the *Animal Spirits*.

A Fifth, That they acted as a Poison; as *Willis*, and many others.

A Sixth, That they clog'd the *Animal Spirits*, by adhering to them, &c.

Not knowing, nor (I think) caring what they said, so they humour'd their own *Imaginations*, and *Hypotheses*; tho' utterly incapable of solving the Effects of *Opium*, especially its most constant, proper, and genuine Effects. For, how can a cold Quality, (which *Opium* never had) cause a gay and brisk Humour, Bravery, Magnanimity, Euphory in Labour, Promptitude to Venus, &c. And, how can Clouds of Vapours hinder the Generation of *Animal Spirits*, by stuffing or constringing the Pores of the *Brain*? Poisoning, fixing, coagulating, clogging or clouding

clouding the *Animal Spirits*, cause a fine Ovation thereof, a Gay, Brave, Courageous, and Magnanimous Disposition, Euphory, Promptitude to Venerary, Serenity, Expediteness in Management, &c. Which are (as has been said) the constant and proper Effects of Opium.

Nor, indeed, was any of those *Authors* so foolhardy as to attempt it; Why then did they write, and trouble the *World* to peruse their *Books*, when they were so far from explaining the *Properties* of Opium, that they scarce ever durst mention them, nor set their *Hypotheses*, and them, as much as in View of one another? Was not this a tacit Confession of the Incompetency of their *Suppositions*? I beg Pardon for calling them theirs, (tho' they themselves do) for I cannot offer them a greater Abuse, than laying their *Spirious* and lame Brats at their Doors.

Tho' one scarce need say any more of them, yet, lest I be thought presumptuous, or saucy, for so much as offering to suspect the general Foundation of all the famous *Authors* that ever lived, (as *Galen*, *Avicenna*, &c. among the *Ancients*; *Etmuller*, *Willis*, &c. among the *Moderns*;) I will shew you very just Causes to suspect the Insufficiency of the general Foundation, viz.

That Opium diminishes or disables the Spirits.

1. I will prove, That it does not do it by a Cold Quality.

2. That it does not do it by Vapours, Fumes, Aura, or any such Way.

3. That it diminishes, or disables the Spirits, by no Means whatsoever.

Which

Which diminishing, or disabling of the Spirits, Cold Quality, and Fumes, (or *Aura*) comprehend the Foundations of all Opinions concerning Opium, that ever I read, or heard of; and consequently if those Two Fundamental Opinions be refuted, all the Superstructures that have been (in this Case) must fall to the Ground.

C H A P. VIII.

The Author shews Just Causes of his Suspicion, that all Authors have gone upon a wrong Foundation in their Disquisitions of the Cause of the Operation of Opium.

I Have shewn you, That the general Foundation of both *Ancient*, and *Modern* Authors, is,

That Opium doth diminish, or disable the Spirits.

And now I will plainly shew *Just Causes of my Suspicion* of its *Insufficiency*, which are these:

1. *I observe*, That all Learned Men are, to this day, highly dissatisfied as to the Cause, and Manner of the Operation of Opium, notwithstanding all that has been written concerning it; and that it is the common Cry on all Hands, that none has illustrated the Operations of Opium to any Purpose, or given any Satisfaction therein; and therefore Learned Physicians are still as much upon the Enquiry, as ever they were.

It is much more Civil and Reasonable, to suspect the Foundation, that all former Authors have built upon, than a general Failure in all the most Judicious Master Builders, that ever endeavour'd to build thereon; for if all the best Architects of the whole World fail to erect a firm Superstructure upon any one Foundation, what can we think, but that the Foundation is infirm? especially when (as in our Case) no Way (that Care, Judgment, Perspicacity, and Wit could invent, or think of) has been

been left untried to build thereon; so that (tho' I modestly call it a Cause of Suspicion) it amounts almost (if not altogether) to a *Demonstration*, that the *Foundation* that all *Authors* have gone upon is naught. Would not any considering Man, when he sees all the *Judicious Architects* of the *World* fail to erect a firm *Building* upon a certain *Foundation*, seek for another? Therefore who can blame me, if I do? and not blame them, that did not? The meanest *Bricklayer*, or *Carpenter*, that should be guilty of such *Stupidity*, as to attempt to build upon such a *Foundation* as always deceiv'd the *Builders*, would be thought too great a *Blockhead* to be employ'd in Building.

2. I observed, That most Men do (notwithstanding that *Foundation* is agreed upon) think it impossible to explain the intricate, various, contradictory *Phænomena's*, and mysterious *Effects* of *Opium*; sitting contented, and perswaded, that it operates by an *occult Quality*, wholly unexplicable, and particularly reserved from the *Knowledge* of *Mankind*: But Nature works *Mechanically* in *Weight*, *Measure*, &c. Therefore it is more than probable, that it is only their being upon a wrong Bottom makes it seem absolutely *occult*; for it is impossible to find a thing, where it is not; or to build firmly upon an *insufficient Foundation*; whereas had it been right, and true, it is not to be imagined, but some or other would have thereupon done something, that would have stood against all *Winds*, and *Storms*; which none have done.

3. I observed, That none durst venture to lay the whole, no, nor one half of the Burthen of the *Phænomena's*, or *Effects* of *Opium*, upon that *Foundation*; foreseeing (doubtless) that it could not bear them, and that if they laid any more *Weight* thereon, the whole would totter, and fall to the *Ground*. The *Project* in every *Hypothesis* is to perswade

swade Men of the *Truth* thereof; and the only way to do it, is to solve all *Phenomena's* thereby; for if it fails but in one, it is an infallible sign of its *Insufficiency*: There was no Reason to omit any of the *Phenomena's*, if they could have discern'd, that the *Hypothesis* would have born them; therefore (as has been intimated) it implies a Confession of its *Incompetency*.

4. I observed, That ancient Authors writ of *Opium*, before it came to be of common and general Use in the *Day-time* with Healthy Persons, (as it since is in many Nations) to cause a gay, pleasant, and good Humour, take off *Sadness*, *Melancholy*, and *Anxiety*; To cause *Affurance*, *Boldness*, *Courage*, *Bravery*, *Magnanimity*, *Euphory*, or ease undergoing of Labour, *Joyns*; *Promptitude* in *Business*, *Expediteness*, and *Serenity*; To excite to *Venerie*, &c. Which Effects cannot be explained by that Supposition of disabling the Spirits, and that they used *Opium* only Medicinally for the sake of such other Effects as might be tollerably well explicated by that *Hypothesis*; so that they had not any Occasion, nor Inducement to look any farther.

The Effects they gave it for was only; 1. To cause Sleep. 2. To take off Pain. 3. To stop Fluxes. 4. To Compose the Spirits. 5. To cause Perspiration, and Sweat. All which are not inconsistent with the *Hypothesis* of diminishing or disabling the Spirits, as the other are, and therefore might well deceive them; For,

First, Sleep is caused by diminishing the Spirits by Labour, Watching, &c. as is most notorious over the whole World; so other Things that diminish the Spirits, as Bleeding, Vomiting, Purging, and many other Causes of diminishing thereof, do incline us to Sleep. Secondly,

Secondly, *Indolence*, or *Exemption from Pain*, is caused by nothing more than want of *Spirits*, as in *Paralytical Cases*, *Stupors*, *Obstructions*, or *Compressions of the Nerves*, *Syncopes*, *Leipothymies*, *Deliquiums*, *Faintings after Bleeding*, and *Sleep*; which (as was said) is so much caused by loss of *Spirits*, &c.

Thirdly, *Fluxes* are stoppt, or moderated, by nothing better than *Sleep*, which generally (as was said) proceeds from loss of *Spirits*; What also stops, or moderates *Fluxes*, more than want of the Sense of the Irritation of *Humours*? And what takes away Sense more than want of *Spirits*? Thus want of Sense by the absence of the *Spirits*, in *Paralytical Intestines*, stops *Fluxes*; Thus fails a *Paralytical Bladder* to express the *Urine*. So a Palsie of the *Membranes*, that include the *Glandules*, must (as in *Sleep*, which relaxes them) stop, or moderate all *Defluxions*, *Catarrhs*, &c. because they are not sensible of the Irritation of the *Humour* by Quantity, or Quality; which Irritation causes the *Defluxions* or *Catarrhs*, by exciting the *Membranes*, to contract, and thereby to squeeze out the *Humours* contain'd in the *Glandules*.

Fourthly, *The Composure of the Spirits* is procured mainly by *Sleep*, which all loss of *Spirits* (as was shewn) inclines us to; so *Bleeding*, which diminishes the *Spirits*, compose their Fury in *Fevers*, *Deliriums*, *Madness*, &c.

Fifthly, *Perspiration* is caused by nothing more than *Sleep*; for we perspire twice as much in *Sleep*, as when we watch, as is most manifestly demonstrable by the *Statick Experiments* of Weighing People; nor is *Perspiration* ever so great as in *Deliquiums*, *Syncopes*, *Leipothymies*, and such like deadish Cases, which are caused by diminishing, or disabling of the *Spirits*, nay, 'tis so in *Animals*,

Animals, quite dead for a little time while they are hot, as is evident by like *Statick Demonstrations*: The true Cause of which is *Relaxation* of the *Pores*, *Skin*, &c. for want of *Spirits* to *contract*, and *constringe* them; as shall be fully proved hereafter (by *God's Help*.)

These Things were (doubtless) the occasion of that *Hypothesis*, of *diminishing* or *disabling* the *Spirits* by *Opium*; but how likely are they to err by establishing it without any consideration of its *enlivening*, *encouraging*, and *brisk Effects*, as *Ovation* of the *Spirits*, *Gaity*, *Bravery*, *Magnanimity*, *Euphory*, *Promptitude* to *Venery*, &c. which can never be solved by *Diminution*, or *Disability* of the *Spirits*, till *Depression* and *Elevation* thereof are *reconcilable*, and *consistent* at the same time in the same subject; which can never be till *Disabling* and *Not Disabling* are the same thing? Have not we then good Reason to suspect that general *Foundation* of *diminishing* or *disabling* the *Spirits* by *Opium*, which was laid by such as never considered any thing of its *generous* and *sprightly Effects*, which (as has been shewn) are its *constant*, and therefore most proper and *genuine Effects*? Who can doubt then but they must err, in laying a *Foundation* quite contrary to the very *Properties* of *Opium*?

5. I observed, That all our *Modern Authors*, and *Physicians*, receiving the Knowledge of *Opium*, its *Effects*, and *Uses*, from those *Ancients*, do use it only for the same *Ends* and *Purposes* as they did; and that our *Modern Authors*, living in these *Western Parts* of the World, very remote from the *Eastern Countreys*, where it is used commonly, and in large Doses, by People in *Health*, in the *day-time*, to *enliven*, *invigorate*, and *encourage* them, and cause the *brave*, *generous*, and *magnanimous Effects*;

Effects aforementioned, viz. *Courage, Euphory, &c.* and finding no *Physician* that went before them, to mention these *noble, cordial, and glorious Effects*; and, if they did at any time slightly touch them, to do it with all imaginable *Disregard, Neglect, and Contempt*, as if there was no Heed to be taken of them, but as *idle Tales, and improbable Stories*, being contrary, and utterly (as they thought) inconsistent and irreconcilable with the *daily, and most notorious Effects of Opium*, observed among us; and to the *Universal Opinion* of all *Authors*, who stated *Opium* to be a *Diminisher or Disabler of the Spirits*, which could not produce (as they concluded) such *contradictory*, and therefore (to them) utterly *incredible Effects*, and *fabulous Flams*, arising (as they fancied) from some silly *Errours*, as want of due *Observation in Travellers*, mistaken *Discourses*, and the like; so that (as the saying is) they let them in at one *Ear*, and out at the other, there being no such contrary *Effects* of any one Thing to be observed in the whole *Creation*; and they being well assured of the other *Effects* by daily *Experience*, and having never observed those *lively Effects*, (for the several plain Reasons that you'll meet in the following Paragraphs) had no cause to alter their *Opinion*, when all Things seem'd to them to make for their *Hypothesis*, for want of a Notion of those *brisk Effects*.

6. I observed, That those *brisk Effects* of *Opium* were not taken notice of by our *Physicians*, nor indeed, (all things considered) do I well see how they should, without getting out of the common *Road* of observing, which is sometimes (as I have found) very useful upon such *Occasions*. For,

First, *Opium* is seldom (if ever) given in these *Western Nations*, but to Sick People, (as the *Ancients* did) who are utterly incapable of those
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brisk Effects, or (at least) to any remarkable *degree*, that might call for a particular or special *Advertency*, or *Attention*; without which, they passed off as they came, without any *Reflection* thereupon; and so signified nothing, as if they had never happen'd.

Secondly, We (as the *Ancients* did) generally give *Opium* when People are going to *Bed*, by which means all Opportunity of *Observation* is lost; because *darkness*, and being alone, hide, or hinder the shewing of any such *Effects*; and the *Physician* (whose only Business it is to be more curious in such Matters) is gone to his own *Rest*, tho', if he were present, not likely to take any *Observations* of such Matters, whereof he has least *Thoughts*, or *Belief*, as being, in his *Opinion*, contrary to all *Reason*, *Sense*, *Experience*, and the *Opinion* of all *Authors*, of the Stupefactive Quality of *Opium*, in which they all agree.

Thirdly, *Opium* is (as was said) given in these Countreys to cause *Sleep*, or such *Effects* to which *Sleep* conduces, as *composing the Spirits*, causing *Indolence*, stopping *Fluxes*, and promoting *Perspiration*; and therefore always given with all careful *Directions*, and *Injunctions*, that may conduce to that *End*, as going to *Bed*, lying still, putting out *Lights*, keeping *Silence*, &c. which concurring with the *Opium*, cause *Sleep*, which is utterly inconsistent with shewing any of those lively *Effects*, that belong only to a *waking Person* to do; so that all Opportunity of *Observation* is utterly precluded.

Now, (all the Premises considered) it cannot be conceiv'd, that such as set their mind upon *contrary Effects*, and expect no other, much less contrary ones, (against which also they are highly prejudiced by their *Reason*, *Experience*, and *Reading*)

ing) should observe such *brisk Effects*, if they did happen; and how can a *brisk Humour*, *Courage*, *ease undergoing of Labour*, *Promptitude to Venus*, &c. be observed in Sick, and Infirm People, lying in Bed, alone, and in the *dark*, or (which renders it utterly impossible) while they are asleep, and the Thing it self disbelieved, and esteem'd contrary to *Common Sense*, and the *Universal Sentiment* of the Learned, and all others. Therefore,

7. If (after all) any such *brisk Effect* did ever happen, it must be either not regarded, or if observed, (which is no *way* likely, as was shewn) you may be sure (for the many plain *Reasons*, and *Causes* aforesaid) that it was not imputed to *Stupifying Opium*, (as all esteem it) but to any other *Cause*, or *Accident*, rather than to a Thing well known to have quite *contrary Effects*. For Instance:

If the Sick Person happen'd to be *good humour'd*, (of which he is seldom capable, and utterly incapable of all or most of the other *brisk Effects*, as *Euphory*, *Promptitude to Venus*, *Exertion of Courage*, &c.) it was either pass'd by as an ordinary Thing of Course, and so not heeded, or else imputed to *Refreshment* by *Sleep*, *Ease* from Pain, or some *Amendment* as to the Disease; or, indeed, to any Thing, rather than *Dispiriting* and *Stupifying Opium*, that is so far (in all Opinion) from exciting the Spirits, that all affirm, conclude, and agree, that it *diminishes or disables them*.

The like is to be said of any of the *lively Effects*, in case they happen, and are observ'd; Tho' I do not see how they can, so (at least) as any *Stander by* will refer it to *Opium*; besides, that as to some of the *brisk Effects*, (especially that of *Venerie*)

Venerary) greater *Doses* are requisite, to render it any thing remarkable, than are used in these *Western Parts*, and that *Modesty* would much hinder the *discovery* of this *Effect*.

Is it not *therefore* very manifest, that I had great cause to suspect, that both *Ancient* and *Modern Physicians* consider'd things by *halves*, since they did not take the most *genuine Properties* into their Consideration, and that they laid their *Foundation* upon the most *contrary Effects* to them? It follows then, That the *general Supposition* of all the *Learned* can no more solve the true *Properties* of *Opium* in any *Probability*, than giving the *Reason* why *Fire hardens Clay* can explain why it *softens Wax*; The *Reason*, did I say! I should have said, than giving the *wrong Reason* why it *hardens Clay*, shews how it *softens Wax*; for it will appear in the following *Chapters*, that they gave no *right Reason* for any *Effect* of *Opium*, even those they ever allow'd to be its *Effects*; nor laid any *true Foundation* to explain the least, meanest and plainest *Effect* thereof; forasmuch as all their *Suppositions* are so false, that there never were any such *Things* as they lay down to explain the *Effects* of *Opium*, viz.

1. No such Thing as a Cold Quality in *Opium*.
 2. No such Things as *Fumes*, &c. flying from *Opium* to the *Brain*, while it is at *Stomach*.
 3. No such Thing as diminishing, or disabling the *Animal Spirits* by *Opium*, any way whatsoever.
- Of which in their Order in the following *Chapters*.

C H A P. IX.

It is proved, That Opium has no Cold Quality to diminish or disable the Spirits thereby.

HAVING shewn just Causes of my Suspicion of that Universal Foundation of Opium's Diminishing or Disabling the Spirits, I will now proceed to a more strict Examination thereof, beginning with the Opinion of the Ancients, who affirm'd,

That Opium diminished or disabled the Spirits by an extream Cold Quality.

I confess that much may be done towards the diminishing, or disabling the Spirits by Opium, if it had such a cold Quality as the Ancients attributed to it; for then it must be such a Coldness, as the coldest Things either actual, or potential, bore no Proportion to; for Ice, Snow, &c. bear no Proportion to it, in causing the same Effects by a cold Quality.

It was the manner of the Ancients implicitly to believe, and subscribe to what their great Authors, and Masters in Physick, or Philosophy, taught them; whom they adored as infallible Gods, as soon as their Mortality proved the contrary; which was as absurd, as asserting, That Opium, which is one of the hottest Things that Vegetables afford, is extream cold; (blessed be God for our Light in Religion, and Liberty in Philosophy!) Therefore some such admir'd Authors, or great Masters in Physick, having asserted, that Opium acted by an

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extream cold Quality, all did implicitly subscribe to it.

The Devil, whom they worship'd, could not (tho' a Deceiver from the Beginning) impose more upon their Faith, than in causing them (for I cannot think but it was some such Evil Power) to believe, that *Opium* was cold, against all the Evidence of Sense and Experience; he might have as well told them, that *Hell Fire* had all the Properties of common culinary Fire, and yet nothing more refreshing by its cold Quality; for as many of our Senses, as can take notice of Heat and Cold, do plainly inform us, that it is very hot in it self, and Effects. For,

1. Its Taste is very bitter, rank, vehemently hot, burning and biting, all which Qualities are infallible Signs of great Heat, and the better the *Opium* is the more intense are those Qualities; Nay, it is observed, that its very Virtue is strictly combined to, or consisting in those Qualities, especially Bitterness, which if lost, the Virtue is gone, as is commonly observed, and easily observable.

It was a wise Fetch of *Amatus Lusitanus*, in Defence of its Cold Quality, to attribute all its Bitterness to *Glaucium*, that was mixt therewith; whereas *Glaucium* always gives a yellow Tincture to Water, and *Opium* a red; but the *Opium*, that gave no yellow Tincture, was bitter also; yea, that was most bitter, that gave the reddest Tincture; How comes *Theban Opium*, and indeed all other *Opium*, to be bitter before any thing is mixt with it? How inadvertently absurd People will be to defend Absurdities; it is pretty to see how they will expose themselves to defend a false Opinion.

2. Its

2. Its *Smell*, which is very *rank, strong, hot,* and such, as Things highly impregnated with *Volatile Salt*, and *Sulphur*, (the Two hottest Principles in Nature) do afford. It is from *Volatile Salt* that *Cantharides*, *Pismire*, *Spear-Wort*, *Crows-foot*, &c. are so very hot, as to blister, (or exulcerate;) and are not all *hot Spirits* such, upon the account of their *Sulphur*? as *Spirits of Wine*, *Brandy*, &c.
3. The best and strongest *Opium* will also exulcerate, (as all *Authors* agree) which only *Fire*, or such Things, as have the Particles of *Fire* lodged in them, as *Lixiviates*, &c. or the hottest Things in Nature, will do; as *Cantharides*, *Spear-Wort*, &c. It is,
4. For the like Reason, a *Psilotrick*, or *Causer of Hair to fall*; which only *Lime*, *Orpiment*, and the hottest Things, do cause.
5. It is *inflammable*, which only *Sulphureous* Things are.
6. It causes a Sense of a *vehement Heat* at *Stomach*, tho' taken but in the Quantity of a *Drachm*.
7. It causes *Driness* of the *Mouth*, and *Thirst*, tho' taken but in the Quantity of 3 *Grains*, which nothing does but hot Things.
8. It *discusses*; and all *Discussers* are *hot*, for it is by *Heat* that they do *discuss*, as *Spirit of Wine*, *Cummin-Seed*, *Volatile Salts*, and all *Hot Spirits*.
9. It soon *Operates*, and in a *small quantity*, which is an infallible Proof of the Activity of its Parts, which argues *Heat*, not *Cold*.
10. It causes a *gay, pleasant, and merry Humour*, which only *Wine*, and hot *Liquors*, &c. do; and one *Grain* of *Opium* will cause them as much as several *Glasses* of *Wine*, which argues; that its *Heat* is much greater.

11. I would fain know *how*, or see any Instance of any Cold Things raising the Spirits, causing Courage, Magnanimity, enabling People to Labour, Journey, &c. as Wine, hot Liquors, and Opium do.

12. Opium does very much open the Pores, and cause Perspiration, &c. which only Heat, as that in Baths, Bagnios, Hot Houses, and Hot Things do; but Cold shuts the Pores, as all know. Therefore,

13. Opium cures; and prevents Colds; which is another Argument of its Heat.

14. It is a great Aphrodisiack, or Exciter to Venerie, which Cold Things chill; but Hot Things; as Cantarides, Bees, Pismires, Onions, Garlick, Leeks, Rocket, Squills, Horse Radish, Sem. Human. &c. do promote.

15. Nothing causes Indolence, given internally, but Wine, Hot Liquors, &c. (as I can think of) and Opium causes it much after the same manner as Wine does, first causing Mirth, and Follity, and, upon increase of Quantity, very considerable Indolence. It is true, that Cold will externally cause a Stupor, if it be intense, so as to constrict the Parts, and exclude the Spirits; but otherwise it makes the Feeling more nice, as all know by Experience, because every little Hurt affects us more when we are cold than hot: But this is not the Case of relaxing Opium, which is used internally to take away Pain, as Wine, &c.

16. Nothing takes away the Effects of Opium (or Drunkeness) better than cold Things internally, and externally; as acids, dipping in Cold Water, &c.

17. Opium relaxes all Parts, which Heat does; and Cold constricts, as was intimated.

18. Wedelius confesses, (tho' it makes against what he says) that he never observed a Soporose Distem.

Distemper, where there was not a *Preternatural Heat*. *Opiolog. Lib. 1. Sect. 1. Cap. 12. P. 46.*

19. If it causes *Sleep* by its *cold Quality*, then all Things, that are *cold*, would do it proportionably; *Cucumers, Purslane, &c.* would be so great *Hypnoticks*, that we should not be able to eat a *Drachm* of them, but that they would cause a great *Sopor*; but there is no such thing; and *hot Things* are much more apt to cause *Sleep*, or a *Sopor*, as *Wine, hot Spirits, Onions, Garlick*, and such like.

20. *Opium* causes a *Redness*, or *Efflorescence* of the *Skin*, making it sensibly warmer, as *Heat, Wine*, and *Strong Liquors* do.

21. It causes also an *Itching* of the *Skin*, which only *hot Things* do.

22. Half a *Drachm* of *Opium* in *Clysters* has caused a violent *Heat* in the *Guts*.

23. It stops *Diarrheas*, or *Loosenesses*, which *Cold* causes.

24. It stops *Defluxions, Coughs, &c.* which *Cold* causes.

25. To pin up all, its predominant Principles appear, by *Autopsie* upon its *Chymical Analysis*, to be *Volatile Salt* and *Sulphur*.

Besides, this *Opinion* of the *Coldness* of *Opium* is very much exploded, and, indeed, it is so apparently *false*, and *absurd*, that I should not have thought it worth while to argue against it, but that it lay so in my way, that regularly I could not well avoid it, without *Breach* of *Order* and *Method*.

I might have added, that it *resolves, attenuates, &c.* but it is needless to say any more.

It is very *false*, and *erroneous*, that it *stops Fluxes* by *incrassating*, and *binding*, which are accounted *cold Qualities*; if so, how should it stop them when Pounds of *Incrassatives* and *Binders* have failed, tho' the *Opium* was given only in the *Quantity* of a *Grain* or *Two*? How should it stop, or moderate *Fluxes*, even while it is yet at *Stomach*, as it most certainly does? It bears (as *Etmuller* well observes) no *Proportion* to the *Bloud*, and *Humours*, to have any *Effect* that may be remarkable upon them, for a *Grain* is but as 1 to 115200 to the *Blood* of him that has 20 Pound of *Blood*, which an ordinary Man has: Besides, How can *Alienuatives*, *Resolvers*, and *Discussers*, *incrassate* or *bind*? But, more especially, How can so great a *Relaxer* of Parts, be a *Constringer* thereof? That is *perfect Contradiction*: And how can a meer *Sal Volatile Oleosum*, in which all its *Vertue* lies, (as will plainly appear) *thicken* and *bind*?

The *Truth* is, that it *stops Fluxes* (as *Sleep* doth) by taking away the *sense* of the *Irritation* of *Humours*, which sollicit the Parts to contract, and so to extrude and squeeze them out; it *promotes Perspiration* by relaxing the *Pores* (as *Sleep* doth;) it also seems to *thicken Rheum*, (as *Sleep* doth) because it causing *Sleep*, or (at least) taking away a *sense* of the *Irritation* of the *Rheum*, is thereby suffered to stay till it thickens by the *Heat* of the *Body*; the *Irritation* also at *Windpipe* being less, because the *Flux* of the *Rheum* is moderated for the *Reason* aforesaid. But of these Things more fully when we come to explain the *Cause* or *Causes* of the *Effects* of *Opium*.

CHAP. X.

It is proved, That Opium sends no Fumes, &c. from the Stomach to the Head, Brain, &c. and therefore that it does not diminish, or disable the Spirits, &c. by that means.

THO' the Opinion of the Cold of Opium is much exploded, that of *Fumes, Vapours, or Aura's*, arising from the Opium at Stomach, and mounting up to the Brain, &c. is as much received and embraced; I know none, but such as think it absolutely necessary, considering that it is most certain, and allow'd by all observing Men, That Opium produces all, or most of its *Effects*, while it is at Stomach; That the *Genus Nervosum* is mostly concerned in its Operation; and that (as was said) there is no Operation, or Action, but by Contact: So that the *Moderns*, acquiescing in the Necessity of its operating that way, because they could conceive no other, (which is no Proof, but a Defect of their Conception) look upon it as invincible and uncontrollable Evidence of its operating by Detachments of *Fumes*, or *Effluvia's*, sent up to the Brain from the Stomach; which appear'd so undeniably conclusive, that neither the want of a sensible Passage, nor any other Inconvenience, signified any thing (*with them*) to the contrary; therefore it became an established Foundation by common Consent; only they differ'd (as was shewn) in the manner how those *Fumes* produced the *Effects* of Opium: And well they might, seeing there is no such thing, nor possibility (if they

were) of ever explicating the various *Effects* of *Opium* by that means, as will manifestly appear.

I confess, that if *Opium* operated by such *Fumes* passing from the *Stomach* to the *Brain*, &c. it would be easie to conceive how it should *diminish*, or *disable*, nay, utterly ruine the *animal Spirits*; and indeed impossible rationally to conceive how they could do otherwise: But then the *enlivening*, *invigorating*, and *encouraging Effects* of *Opium*, which are its *constant* and most *genuine Off-spring*, would lie upon our *hands*, without any possibility of giving an account thereof; for certainly dull, heavy, unnatural, undigested, and cloudy *Fumes*, or *Vapours*, could not advantage the *animal Spirits*, cause a *Triumph*, or *Ovation*, thereof, at their access, *Courage*, *Serenity*, *Promptitude*, *Magnanimity*, *Euphory*, *Inclination to Venerary*, &c. which we are most obliged to regard, as being its most *natural* and *proper Effects*.

This *Opinion* of the *Moderns* does presume, or suppose, (for they prove nothing)

First, That *Fumes*, or *Vapours*, do readily and freely pass from the *Stomach* to the *Brain*, because the gross *Fumes* (as they call them) of a Grain or two of *Opium*, always operate before it is out of the *Stomach*.

But they never saw such *Fumes* pass, nor their *Passage*, only suppose both; and that meerly upon an *Imagination* that it must be so, because they (forsooth) cannot conceive any other way by which *Opium* can affect the *Head*, *Nerves*, &c. while it is at *Stomach*; whereas I can, and shall (God willing) shew them another means, or way, to do it, that is *sensible*, and not wholly *precarious*, as theirs is, and that in the meanest manner; because all their *Grounds* to suppose it, is their *Inability* to conceive,

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ceive, or apprehend, what is (as I shall shew) very sensible, nay obvious also.

Secondly, They suppose, That such Fumes will serve to solve all the Phænomena's and Operations of Opium; whereas it is utterly impossible they should solve the enlivening and invigorating Effects thereof, (as has been shewn, and shall be further proved, if God permits.)

It were easie to evidence, but that it would be tedious and needless, (for their Incompetency to solve the most proper Effects of Opium, is more than enough) that such Fumes, or Vapours, can truly solve no Effect of Opium, unless it be that of Death, or some deadly Symptoms; nay, they will not solve the most likely to be caused by Vapours, viz. Sleep, which all Men (as Wedelius says) allow to be the Effect of Fumes, or Vapours, (in his *Opiologia*, c. II. p. 35.) "*Somnum naturalem* (says he) *omnes concedunt producere suaviore, & blandas* "*διαδυσμδους, seu Vapores primum διαδυσμδου de-* "*mulcentes, qui cum spiritibus animalibus mixti torpi-* "*dos quasi illos reddunt:* That is, "All grant that "*kind and gentle Fumes do cause natural Sleep, &c.* Which is most certainly false; tho' I very much doubt, that this groundless Presumption, which (as he intimates) all embrace, has been a great cause of this airy Imagination of Fumes in the Case of Opium; because Men looked upon Sleep (agreed upon to be caused by Fumes) to be the prime, leading, and most proper Effect of Opium; which is also false, it being but a meer Accident, (as has been shown) and when it happens, generally requires lying, or sitting still, to assist it; whereas the Watching, that is the Effect of Opium, requires no help, and cannot be put off (as Sleep can, by Motion, Action, &c.) notwithstanding all Endeavours to the contrary. Now I would know of any

any Man, which is the most proper and natural *Effect* of any *Cause*, That which nothing can hinder, or that which every *Action* can? But I run too far upon this matter, which belongs more aptly to that part of this *Book*, that explains all the *Effects* of *Opium*; and so must return to that of *Fumes*, which do not cause *natural Sleep*, as manifestly appears,

1. Because that which causes *natural Sleep*, must, in all Reason, (as it is always in the wise Work of *Nature*) bear a *Proportion* thereto; but *Fumes* (supposing their *Being*) bear no *Proportion* to our *Sleep*. Certainly a working *Labourer*, that toils all the *Day*, must spend the *Fumes* of his Body in the highest *degree*; and feeding upon dry *Bread* and *Cheese*, must breed fewest *Fumes*; yet none sleeps better or sweeter than he. The like is to be said of a *travelling Man*, a tired *Person*, &c. who often fall asleep before they eat or drink to renew their *Fumes*, which they had spent in an extraordinary manner. Why *Sleep*, that is design'd for *Refreshment* and *Recruit*, should depend upon *Fumes*, no Man can tell; for then our *Refreshment* would wholly depend thereon, and no Man have any *Recruit* by *Sleep*, but in *proportion* thereunto. Who dares accuse our *Wise* and *Good Maker* of such *Contrivances*, who in *Nature* always proportions Things to the *Exigencies* thereof? and therefore *Sleep* not to *Fumes*, but to that which was impair'd in us for want thereof; which is always contriv'd by *Wise Nature* (if you'll observe it) to be the prompting *Cause* to the *Recruit*; and then *Proportion* is duly observ'd, because we are prompted exactly according to the *Exigence* or *Necessity* of *Nature*, as becomes the *Wisdom* of our *Creator* and *Preserver*. This Rule (if duly attended to) will easily, speedily, and certainly lead

lead you to the *Knowledge* of the true *natural Causes* of *Hunger*, *Thirst*, *Inclination to Sleep*, and all such *Calls* for *Restoration*. All which I could soon satisfy you in, but that it is not my *Business* at present, and that it will too much anticipate my designed *Traç* of *Animal Mechanism*.

Nor doth *Labour* it self bear any *exact Proportion* thereunto, because many healthy People, that are idle all day, sleep long, soundly, and sweetly, every night, as well as *Labourers*: So that (in short) it must be somewhat that belongs to *Watching* as such; for *Sleep* generally bears the best *Proportion* to *Watching*. If we watch much, or little, our *Sleep* bears some *Proportion* thereto; tho' there may be in this, as well as in *Hunger*, *Thirst*, &c. *Accidents*, that cause the *Promptitude* to be more or less, and so vary the true *natural Proportion*; all which have the Nature of *Diseases*, as *canine Appetites*, *Coma's*, *Caros*, *preternatural Thirsts*, &c.

What it is that *Watching* causes to prompt us to *Sleep*, must be some *Impair* made thereby as such, and not the foolish *Conceit* of *Fumes*: And it were easie for me to illustrate what it is, but that it will require some *Sheets of Paper*, and (as I said before) anticipate my *Discourse* of *Animal Mechanism*, which I hoped to have published before this *Book*, and would have been most convenient, because the *Principles* therein stated may serve to explain the *Effects* of *Opium*; but that the want of a few *Experiments* has (to my Grief) hitherto delay'd it; and therefore I must be put to much *Trouble* in this *Work* for want thereof, because I am resolved not to spare my self, in order to satisfy the *Reader* in this great and unexplicated *Mystery*.

2. If *Vapours* were the cause of *natural Sleep*, it is impossible that the *prick* of a *Pin*, or a *sharp Sound*, &c. should awake one ten or twenty times in an *Hour*; for *either* the *Prick* must in an *instant* disperse all the *Fumes* in being, which is impossible to be imagined, and they as often return to cause *Sleep* again; or intercept their *Motion* from the *Stomach* to the *Head*, which no *Man* can have any *Conception* of the *Efficacy* of the *Pin*, or *Sound*, so to do: Or they must both *disperse* and *intercept* the *Fumes*, (which indeed if the case were such, would be necessary to make a clear *Awaking*) which is yet far more unconceivable. What paltry *Trifles* does the *World* embrace, instead of *Truth* and *Reason*!

3. Several *Persons* (whereof I am one) do awake in a minute or two after they first fall asleep in *Bed* at *night*; which would be absolutely impossible, if *Fumes* caused *Sleep*; for the *Fumes* would increase *more* and *more*, and make one *more* and *more* remote from waking.

4. Why should *warm Baths*, *Fomentations*, *Feet-washes*, *Head-washes*, *warm moist Weather*, the *Act* of *Venery*, the *Pleasure* of *sweet Melody*, *gentle rubbing* of the *Head* in a pleasant manner, *scratching* the *Back* where it itches, and all gentle *Pleasures* that are consistent with *lying*, or *sitting* still, which do all cause a very free *Perspiration* of *Fumes* at the *Pores*, (that are then most certainly opened by all those *Causes*, as may be proved by *statick Demonstration*, *Magnifying Glasses*, &c.) cause *Sleep*, seeing they all cause a spending of the *Fumes*?

Obj. Some half-witted, unthinking *Carviller* may say, That such Things stir up the *Vapours*, &c.

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Ans. What such mean by *Vapours* stirr'd, is not easily determinable; but this I know, that all stir of *Humours*, or any other thing, hinders *Sleep*; and that the longer such Causes of opening the *Pores*, and consequently of perspiring *Fumes* do last, the more we are inclin'd by them to *Sleep*; so that the more our *Fumes* have been spent, the more we are inclined to *sleep*; which is a strange *Contradiction*, if *Fumes* be the cause of *Sleep*.

I can but smile to think how most Physicians come to call several things *Vapours*: First, they say, that *Sleep* is from *Vapours*; then call every thing *Vapours* (*right or wrong*) that inclines us to sleep, by reason of that false *Supposition*: How then comes *Camphire* not to be a great Causer of *Sleep*, that is so apt to evaporate?

5. *Fear, Sorrow, Grief, Melancholy, Depression of Spirits, Cold, &c.* do most certainly close the *Pores*, (as appears by *statick Experiments*) by which means *Vapours* are much crowded in the *Body*; yet all such *Grievances* do hinder *Sleep*, as they also do the *Effects* of *Opium* and *Drunkenness*: Therefore they do not proceed from *Fumes*, as the *World* imagines; for then these things that crowd in the *Fumes* and *Vapours*, would promote, not hinder *Sleep*.

6. If *Fumes* are the cause of *Sleep*, then are the cause of *Sleep* and *Vertigo's* (as the *Vaporanians* allow) the same, it follows then that we could never sleep without a *Vertigo*.

7. Many (as *Dr. Willis* says) eat their *Meat*, take their *Drink*, &c. as other People, yet do not sleep at all for many *Weeks* together; which were impossible, if the *Fumes* of *Meat* and *Drink* caused *Sleep*; for they, by eating and drinking, mult

must have those *Fumes*, and consequently *Sleep*, as other People, if that were true.

Thirdly, *They suppose and take it for granted, (which I do not, for I know the contrary) That Opium, while it is at Stomach, can affect the Brain, &c. no other way but by Fumes; which is a most groundless Supposition: For,*

1. How should a *Lump of Curd at Stomach*, or the *Haft of a Knife swallow'd*, and many such things, which can send no *Fumes* to the *Head*, cause *Convulsions*, *Head-achs*, *Vertigo's*, *Syncopes*, *Leiporhymies* of the whole Man, *Manias*, *Furors*, &c. if there were not another way for things to affect the *Nervosum Genus*, &c. while at *Stomach*, besides sending up *Vapours* to do it? But of this matter, to shew how a thing at *Stomach* may affect the *Brain*, and the *whole System of the Nerves*, &c. and how *Opium* does it without *Fumes*, the 17, 18, 19, 20, &c. Chapters will shew you at large: Therefore I shall say no more of this at present, for it is fit for us first to overthrow that *Supposition of Fumes and Vapours*, before we establish our own. For farther *Satisfaction* then, as to that general *Supposition of Fumes*, let us duly and fully consider Things; for it is not a slight matter to proceed against a *General Opinion*, that has continued through all *Ages*, or to wipe off the *Prejudices* acquired thereby. *Observe,*

1. That the *Brain* is a *Principal Part*.
2. That it is *very soft, tender*, and next to a *Fluid*.
3. That *very small, fine, and gentle Things* do *highly offend it*, as the *Effluvia's* of *sweet*, or *ill-scented Things*, causing *hysterick and epileptical Fits*, *Syncopes*, *Faintings*, &c. It is also notorious among

among us *Physicians*, that a little *Fume*, scarce sensible as to *Quantity* or *Quality*, rising from a *Toe*, *Finger*, &c. and arriving at the *Brain*, causes dreadful epileptical *Fits*, *Vertigo's*, &c.

4. That our *Wise* and *Provident Creator*, has therefore secured and fortified all the *Avenues* of the *Brain*, in a more particular manner, by several *Circumvallations*, viz.

First, With the *Pia Mater*.

Secondly, With the *Dura Mater*, called so from its *Hardness*, *Solidity*, and *Strength*.

Thirdly, With a *strong Skull*, of a round or arched *Figure*.

Fourthly, With the *Pericranium*.

All which belong to it particularly, besides other *Integuments* common to it, with other *Parts*; as,

1. The *Skin*. 2. The *Cuticle*. 3. The *Membrana Carnosa*. 4. The *Periosteum*: All which do surround it; and after all, it is Thatched (as it were) with *Hair*.

5. That the same *Providence* has taken care (which is very observable) that none of the *Objects* of *Sensation*, nor (probably) any *Particle*, or *Effluviu*m, that flies from them, should ever reach the *Brain*, but only bare *Impulses*, and they not immediately convey'd, but by the *Intervention* of a *fine*, *tenuous*, *soft*, *gentle*, and most agreeable *Aura*, viz. the *Animal Spirits*, lest any *Offence* should be given in the least manner to this most tender, delicate, principal *Part*, and *Royal Seat* of the *Soul*; all which Care had never been, without *Necessity*; for *God* and *Nature* do nothing in *vain*.

And

And if you'll duly consider the *Organs* of Sensation, that are near the *Brain*, you'll find that they are contrived as *Shutters*, to exclude all extraneous Particles from the *Brain*; for *Impulses* might have been contrived without their *Intervention*, because they do not alter or improve the *Impulses* received from Objects; for if they did, we should not have true notice of Things: And seeing they do not alter, or improve the *Impulses*, of what *Use* should they be but to exclude extraneous Particles, *Fumes*, *Effluvia's*, &c.

For instance: The tremulous Motion of the *Air*, in the case of *Sound*, would have as truly hit the *Auditory Nerve*, or *Membrane*, without the *Tympan*; and very often much truer without it, because of the several *Faults* and *Disorders* that it is liable to: Yet so necessary was it thought by the best of *Judges*, who cannot err, that it was rather to be placed there, with all its Inconveniences that might follow; than any way expose the *Brain*, though to the most gentle of Bodies, viz. the *Air*, by which (in all probability) the *Animal Spirits* themselves are nourished, or sustained.

Were it not that extraneous Particles, or *Air*, would offend the *Brain*, What need is there of the *Tympan*, when we know as well by Experiences, as by the aforesaid *Reasons*, that a *Dog*, &c. can hear as well without it, upon the first taking it off, but that the Hearing will afterward decay, because the *Brain*, &c. being exposed, will be injured?

What is evident in the case of the *Ear*, may be made so as to the *Nose* and *Eyes*; for though some of my *Readers* may not easily conceive it, the Representation of Things might have been conveyed by *Reflections* and *Refractions* of Light, without exclu-

excluding the *Air*, but that it was more convenient and safe for the *Brain*, and *Optick Nerve*, (which is much the same matter with the *Brain*, and a Production thereof) that the *Air* should be excluded.

6. [Notwithstanding all this Care to exclude extraneous *Particles*, how fine soever, we do find that those very *Impulses*, conveyed by the *Animal Spirits* themselves, in the most gentle manner imaginable, do often offend the *Brain*.

Now fairly consider the great *Excellency* and *Use* of the *Brain*, viz. to separate the *Animal Spirits*, to accommodate the *Soul* with a fit Seat for it; its *Tenderneß* and *Softneß* to be next to *Liquidity*; how carefully it is guarded with about nine or ten *Circumvallations*, or considerable *Integuments*; that those we commonly call *Organs of Sensation*, are contrived for Shuttters out (or Excluders) of the least extraneous *Particles*, *Effluvia's*, or *Aura*; that the least *Fume* that rises from any Part, and arrives at the *Brain*, causes such terrible and dismal *Effects*, and that most gentle touches of the *Animal Spirits* do offend it, so as to cause tragical *Events*, as *hysterick Fits*, *Vertigo's*, &c. Is it likely, that notwithstanding the *Considerableness*, *Tenderneß*, *Use*, and *Excellency* of the *Brain*, the extraordinary Providence used in guarding it from *Effluvia's*, or extraneous *Particles*, how fine soever, and the apparent *Mischiefs* that the least *Fume*, nay, bare *Impulses*, presented by the *Animal Spirits*, do cause; that the same Providence that so guarded it (which does nothing in vain) should, after all its Care and nice Circumspection to exclude the least *Fume*, &c. permit, and freely let loose upon it, and into it, whole and even continual *Gusts*, *Blasts*, and *Vulcano's*, of acid, acrimonious, putrid, hot, stinking, corrosive *Fumes*, *Vapours* and *Steams*,
F arising

arising from *glutted, debauch'd, and surfeited Stomachs*, containing all imaginable *Trash, Hodge-podge, Vermine, Choler, &c.* sure it is much fitter quite to discharge and rid Nature of them at *Mouth*, or rather send them downward with their fit Companions, the *stinking Ordure and Excrements*, than prefer them to the Highest and Noblest Part of the *Animal and Sacred Mansion of the Soul*.

For if there be so *ready, free, open, and constant a Passage* (*sensible, or insensible*) for the *Fumes of Opium*, which never fails of its *Effects*; then certainly must the *Passage* be alike free to all other *Fumes* from the *Stomach*, seeing they are so to those gross, venomous, and pernicious *Fumes of Opium*, as *Willis*, and most of the *modern and ancient Physicians* do state them to be: Then farewell *Soul, Brain, Life, and all*; for it is not conceivable that the *Man* can hold out one *Hour* under such *horrid and dismal Circumstances*, and dreadful *Erućtations* of rude and crude *Fumes*, who could not bear the arrival of the *least Vapour*, scarce sensible in *Quantity or Quality*, arising from any other *Part*; Or is it a peculiar *Priviledge* that the *Stomach* has, thus to send *Farts* with their *Heels upward*, (as *Belching* is call'd) without any offence, to perfume the *Soul's Presence-Chamber*, (saving your *Presence* however?) Foh! for shame! What sort of *Opinions* are these? What *thick, stinking, and dark Clouds, Scotomies, and Stupors*, must the *Opiniators* be under, by their own Consent?

7. If this were the case, no *Part* in the whole *Body* would be in such a miserable state as the *Chief*; for the *Rectum, or Colon*, are fitted and fortified by *Nature* to bear such *Things*; so is not the *tender Brain*.

8. What

8. What Horse's Brain, much less Humane one, could bear, incessant *Rakings*, *Penetrations*, *Stuffings* of such *unnatural*, *indigested*, *heterogeneous*, *rugged*, *acid*, *acrimonious*, *putrid*, and *impetuous Fumes*? If

Gutta cavat Lapidem non vi sed sæpe cadendo;

What would become of the tender *Brain*, thus rudely rubb'd and grated, all the days of our *Lives*, if it could hold out any? for it is incredible it should.

9. How would the *Pores* of that soft Substance, which have no less Office (as 'tis universally received) than to separate *Animal Spirits*, (which are or should be the finest and most subtile, tenuious, and principal Things in an *Animal*, next the *Soul* it self) be discomposed, torn, dilated, stuffed? What a blessed Secretion of *Animal Spirits* (if any) would there be!

10. It is observed by all, That the *Brain*, tho' very soft, receives the least Change of any Part of the *Body*; which could never be (considering its tenderness) if it were so raked by all sorts of *Fumes*; for then doubtless such a *Body* would be most changed of any in *Colour*, *Substance*, *Texture*, *Bigness*, &c. What would become of *Memory*, and indeed of all the *Faculties* of the *Brain*? Can a soft, yielding *Substance*, continually discomposed, preserve *Impressions* made thereon? If *Fumes* flow'd continually through the *Brain*, they must wear out all *Impression*, yea, and the *Brain* it self, in a short time.

11. It would be very dangerous to eat or drink, if the *Brain* must suffer so much by the *Fumes* of *Meat*, *Wine*, &c. It would be hard to know whether it was best to eat or not, for both must be fatal.

12. What a vast *Difference* should we observe, as to *Serenity of Mind*, &c. when empty and full? For in this last case, the *Brain* must be all in a *Cloud*, or a *Cloud* in it, or *both*; yet are Men much more *serene*, prompt, and fit for any thing, after some *Glasses of Wine*, than before, and after moderate *Eating*, than when *Hungry*, which makes them faint, peevish, ill-humour'd, and listless.

13. If the *Vapours*, or *Fumes*, of *Opium*, flying up to the *Brain*, caused all its *Effects*, it is very strange that our *Fumi venduli* had not long since found out the *Mountebank-Gambol* of standing upon their *Heads*, to prevent all *Mischief* from *Opium* taken in a great *Dose*; for *Fumes* in a warm living *Body* would not descend into the *Head*. I wonder they did not find out such an easie and natural *Consequence* of their *Hypothesis*, if true; they might then have boldly mounted any *Stage*, freely taken *Opium* in the sight of the admiring *Rabble*; their *Summersets*, *Going* upon their *Hands*, &c. would have secured them, and turn'd *Danger topsie-turvy* by the help of a *comical Gesture*. This is indeed somewhat to *purpose*, if it succeeds; if not, I should think 'twere enough to ridicule their *Hypothesis* out of all *Credit*, without any farther *Arguments*. I dare join *Issue* with them upon that *Point*, that it will not succeed, though a necessary *Consequence* of their *Opinion*, if true; wherein they will have this *Advantage*, That they'll confess with one that never did (or will) try it, as being well assured of the *Falsity* of both the *Hypothesis*, and the *Experiment*, without such a *Trial of Skill*.

Now I think that I have said enough, and would willingly give over arguing, and spending any more *Time* to confute an *Hypothesis* so absurd, that it must needs appear so to any regular
 Thiaker

Thinker without my *Help*; but all are not such, and the *Prejudices general and inveterate*, and of *some thousands* of Years standing, having continued through all *Ages* to this *day*; and I would fain quite put out this false *Light*, that (like *Will of the Wisp*) has brought many a Man into the *Pit of Destruction*, or *Grave*, while *Physicians* were guided thereby. Therefore it being no slight *Work* to undeceive many, and a very good *Work* (if possible) to undeceive all; I will (lest what I have said be not sufficient to that *end*) add somewhat more to the same *purpose*; though (I doubt) some will not be convinced till I shew them how Things while at *Stomach*, may cause all the *Effects* of *Opium*, by a *sensible Operation*, without the *Help* of *Fumes*, *Vapours*, *Effluvia's*, *Aura*, or any any such thing; which have been the *Asylum* of the short-sighted, that could see no other Means, and therefore (as was said) concluded Things must be as they thought, presuming that nothing could be that they did not see. A special *Inference*, and a very improving one, which must cause People never to seek for any thing! For why should they, that think there is nothing but what they see, look any farther? To proceed then:

14. It is agreed on all *hands*, (as I take it) That the *Animal Spirits* are not generated till there is an *Appulse* of the *Bloud* at the *Brain*: Can it therefore be imagined, That *Indulgent* and *Wise Nature* should contrive a speedier *Way* to *destroy*, *diminish*, or *disable the Spirits*, by *Fumes* and *Vapours* out of the *Stomach*, than to generate them? These are not the *Ways* of *Equal Nature*, which destroys and generates by the same *Road*; so that if *Animal Spirits* are generated by the *Bloud*, they are diminished by some *Defect* therein; as want of

Matter in the *Bloud* for that purpose; the *Bloud* not arriving at the *Brain*, and the like.

Note, That I spoke in the last Paragraph of *diminishing*, (or destroying) not bare *disabling* the *Spirits*; for the *Spirits*, or *sensitive Soul*, may be depressed (or disabled) for some time, and excited, or elevated, by other means than that of the *Bloud*, as by *Pleasure* or *Displeasure*, *Joy* or *Grief*, &c. Thus *good News*, or the *Pleasure* of any of the *Senses*, enliven, invigorate, or elevate the *Spirits*, or *sensitive Soul*, in a moment; this is the way that God has provided for us upon sudden *Exigencies*, *Deliquiums*, *Lepothymies*, &c. and thus *Cordials* work so speedily (as you'll find hereafter;) so may there be a sudden *Depression* of the *Spirits*, as by *ill News*, *Pain*, &c. which (if you'll be pleased to remember) will much illustrate Things hereafter.

15. The ordinary *Strainers* of the *Body* are so ordered, that they will not admit *Particles* of another *Figure*, especially if larger than the proper *Particles*; much more should it be so with the *Principal Strainer* of the whole *Body*, (I mean the *Brain*) both for its *safety*, and of the *whole*, which depends upon the *Animal Spirits*, that are strained, or separated, from the *Bloud* in the *Brain*; therefore the *Particles* of *Opium*, which are esteem'd gross by all, (however are more so than the most *tenuous Animal Spirits*) cannot enter into the *Pores* of the *Brain*, to diminish or disable the *Animal Spirits*, in case its *Fume* arrived there.

16. It was never the *Method* of *Nature* to send Things crude, unprepared, and undigested, into the inmost and principal *Recesses* and *Parts* of the *Body*, without passing gradually by the several
Dige-

Digestions, Concoctions, Changes, Percolations, Circulations, &c. preparatory thereunto; therefore it will not permit crude and indigested *Fumes* any access to the *Brain*, till they have (as it were) performed their *Quarentine* elsewhere; nor will *Nature*, which always acts consentaneous to it self, provide any *Passage* for such rude and crude *Foreigners* and *Strangers*, to ravage the principal Part of an *Animal*.

17. They cannot pass by the *Arteries*, which carry nothing out of the *Stomach*, but all into it, or towards it, and that with a violent Motion, which opposes any thing that would pass that way.

18. Nor by the *Veins*, which carry nothing into the *Brain*; but if they enter'd the *Veins* at *Stomach*, they must thence pass into the *Right Ventricle* of the *Heart*, where being rarefied by *Heat*, they must take up much room, and sadly discompose the Motion of the *Bloud*, and also enter this principal Part in a crude condition, (tho' much better able to bear them than the *Brain*) then must they pass into the *Lungs*, where you may be sure they will be so saucy as to take up the uppermost Room; and how they will be brought down again into the *Left Ventricle* of the *Heart*, (which they must vouchsafe to do, before they can get into the *Brain*) none can tell: There then must they stick, and cause an *Asthma*, unless the Man has the good Luck to be rid of these *Rovers* by *Breathing*, and then (Joy be with them! as there will be, when they are gone) they are lost, and never arrive at the *Brain*: And if it could be conceived, that they condescended to come down from the *Lungs*, (contrary to their *Levity*, which is not to be thought) what *Pranks* must they play in the *Left Ventricle* of the *Heart*, and what at *Brain*, considering it cannot bear the least *Kapours*: (as

has been shewn;) whereas in this *Case* there must be a continual Stream thereof, and consequently a *discontinuance* of the *Bloud*, and its Motion. See then how little *Thought* they must have, that assert it is convey'd with the *Bloud* either to the *Veins* or *Arteries*!

19. Nor by the *Lympheducts*; for then they must, contrary to their natural *Levity*, descend into the *Receptaculum Chyli*, and out of the *Subclavials* into the *Right Ventricle* of the *Heart*, and afterward run all that wild *Risque* mentioned in the last *Paragraph*, which was shewn to be impossible.

20. Nor by the *Nerves*; for then they must either run up in the *Road* of the *Animal Spirits*, or in some *By-way*. If they passed by the *Road* of the *Spirits*, then must the *Spirits* be stopp'd for that time, (which is no short one) and we suffer a *Paralysis* of the *Stomach* all that time, or be much disturbed and interrupted; then should we have *Convulsions*, or at least some degree of a *Paralysis* of the *Stomach*.

And if they passed by some *By-way*, or *Road*, besides that of the *Animal Spirits*, then must it be a *full*, or an *empty one*; if full, that Humour (as suppose a *Succus Nutricius*, for once) must be disturbed and discontinued, (as the *Animal Spirits* were shewn to be;) and if empty, it would follow, that *Nature* had *void* and *useless Ducts*, which none ever had the Folly or Confidence to assert; or that *Nature* contrived them for that *purpose*, which is (as has been shown) directly against its *Methods* and *Advantage*.

But after all, whither would you have them march in this *By-Road*? for they could not mix or communicate (as good Luck is) with the *Spirits*; and if they did, it is impossible it should be without such Disturbances as I mentioned would follow, if they passed in the *Road* of the *Spirits*; it is

is not common Sense, that such *crude Blasts* should *meliorate*, or *enliven the Spirits*, to cause *Briskness*, *Bravery*, *Serenity*, *Courage*, *Magnanimity*, as *Opium* does, much less if those *Fumes* stopp'd and crowded in the *Brain*, and any way hinder'd the *Generation of Animal Spirits*, as the common *Assertion* is.

The like is to be said of their passing between the *Pia Mater*, and the medullary Part of the Nerve, (which cannot be allow'd, because of its close *adherence* thereto) with this addition, That they would constantly cause a *violent Head-ach*, which *Opium*, and *Meals*, (to which *Fumes* are particularly attributed) do often cure.

So if they got up to the *Head*, between the *Pia* and *Dura Mater*, it is *Head-achs*, and not the *Symptoms* of *Opium*, that they would produce; which *Head-achs* (as was said) *Opium* and *Meals* do cure.

21. *Lastly*, If they pass'd by any means quite on the outside of the *Nerves* and their *Membranes*, (*viz.* the *Pia*, and *Dura Mater*) then must they take their Lodgment (if within the *Skull*) between the *Dura Mater* and the *Skull*, and produce no other *Symptom* but a *Head-ach*, which (as was said) *Opium* and *Meals* rather cure than produce; and if without the *Skull*, it is quite beside the *Cushion*, and the *Vaporarians* own *Intention*; for in all these last *Cases*, they could not affect the *Animal Spirits* for good or evil. Many and very many things may be added, to shew the *Impossibilities*, *Inconveniences*, *Incoherences*, *Absurdities*, &c. that attend the *Passage* of the *Fumes* and *Vapours* into the *Brain*, *Head*, &c.

22. I had forgot mentioning the *Absurdity* of its passing up at *Gullet*, and so to the *Head*, because I could not imagine that any one would be so

so beastly an *Animal* as to belch up an *Argument* of that kind, considering our very *Senses* tell us, that what comes up that way passes out at *Mouth* or *Nostrils*, and because, if it were so, the *Operation* of *Opium*, &c. would be in *proportion* to our *Belching*, which is *ridiculous*.

23. The greatest *Comfort* of a *Cordial* is at first, or soon after it is taken; but if its *Comfort* were by *Fumes*, or *Effluvia's*, passing to the *Bloud*, or any where besides, the *Comfort* would (as their *Cause of Fumes* do) increase for a long time, and be more after a good while than at first. So,

24. If *Opium* operated by *Fumes* while at *Stomach*, which must gradually increase continually, how comes *Opium* to be at the height of its *Operation* in a short time, *viz.* in about *half an Hour* after it begins sensibly to operate, or an *Hour* at farthest, and not increase continually in its *Operation*, as their pretended *Cause* the *Fumes* must do by continual steaming?

25. If *Opium* operated by sending *Fumes* by *Passages*, &c. from the *Stomach* to the *Brain*, I should think that when it has got out of the *Stomach*, as into the *Intestines*, *lacteal Veins*, &c. there should be a kind of *Interval* of its *Operation*, (which is never observ'd) till it got into the *Bloud* again; therefore it does not operate by *Fumes*, for the *Pylorus* is always shut, but when somewhat is sent downward, which would hinder the mounting of the *Vapours* into the *Stomach*, in order to pass to the *Brain*.

26. If *Vapours* were the cause of *Sleep* after *Meals*, then should we be more sleepy two or three *Hours* after *Meals*, because of the *abundance* of the *Fumes* that would be crowded into the *Brain* by that time; but we are more sleepy presently after *Meals*, and if we indulge it but for a *quarter* of an *Hour*, we are refreshed, and far from *sleepiness* after-

afterward, tho' the *Fumes* (if that *Hypothesis* were true) would be much more at *Brain* two or three *Hours* after the *Meal* : So it is in the case of *Wine*, if one take a short *Nap* after some *Glasses*, he may drink a great many afterward without being sleepy ; which plainly proves, that it is not the *Fumes* of the *Wine* is the cause of the *Sleep*, because he is not at all sleepy, when there must be more *Fumes*.

27. All allow, that hot *Fumes* assaulting the *Brain* cause *Phrensies* ; if that be true, then the *Fumes* of *Wine* and *Opium* (which are both very hot) must always do so ; but *Opium* and *Wine* also do often cause *Composure*, *Good Humour*, *Sleep*, &c. which are contrary to *Phrensies* ; therefore they do not operate by *Fumes*.

28. " If *Sleep* (says *Helmont*, the only Man that " I have read who is against *Vapours*) is caused by " *Vapours* ascending from the *Stomach* to the *Head*, " obstructing and intercepting all the *Passages* of *Sen-* " *sation*, *Motion*, *Speech*, *Judgment*, &c. (as the " *Schools* say) then a *Disease* would have been be- " fore the *Fall* of *Adam*, because *Sleep* would have " been a *Disease*, that is, a flatulent and vaporous " *Palsie*.

29. All allow *Vomitives* and *Purgers* to operate by *Irritation*, or a grievous *Sensation* of the *Mem-* *branes* of the *Stomach* ; Why not *Wine*, *Cordials*, *Opium*, &c. by a pleasant *Sensation* ? *Cujus est Dolor* (aut *Gravamen*) *ejusdem est Voluptas* ; and as a grievous *Sensation* (or *Pain*) causes *Melancholy*, *De-* *pression* of *Spirits*, *Fretfulness*, *Lassitude*, &c. so a pleasant *Sensation* causes *Comfort*, *Elevation* of the *Spirits*, *Euphory*, &c. But we have not cleared the *Way* sufficiently for these *Matters* yet, which will in due time be solemnly considered.

Obj. It may be said, That both *Vomitives* and *Purgatives* take some *time* before they operate, unless a *Nausea* upon *Aversion* causes them to work sooner ; for Things must have *time* to insinuate themselves (or soak) through the *Crusta Carnosa* of the *Stomach*, and afterwards to affect its *sensile Coat* ; which argues that *Wine* and *Cordials*, which operate immediately, do not operate that way, but by *Fumes* (or *Effluvia*) passing into the *Brain*, or *Bloud*.

Ans. I doubt indeed, that this *Difference* may be an occasion of referring the Effects of *Cordials*, and those of *Emitticks* and *Catharticks*, to different Causes ; but it is very strange, that they should go so far as the *Bloud*, or *Brain*, to seek for the Cause of the Operation of *Cordials*, which operate in a *Moment*, and go no farther than the *Stomach* for the Cause of the Operation of *Vomitives* and *Purgatives*, which take more *time* to operate ; especially seeing the *Bloud* and *Brain* have no *Sensation*, and that all *sensitive Comforts* happen by that means, I think it were much more proper, first, to consider the *immediate Part* upon which they insist, (when at *Stomach*) especially seeing it is so very *sensible*, before we run roving I know not whither, to seek for the Cause of a Thing that works, pleases, and comforts the *Stomach*, as soon as it is down. I take my self running off the proper *Subject Matter* of this *Chapter*, and anticipating that of another ; therefore I will be short, and deliver my *Opinion* in this Case by way of *Position*, with a familiar Instance to illustrate it, which may in some measure prepare you for the Proof of it, and what is to be said thereof more at large hereafter

of Opium Revea'd. 77

I say then, that *hot spirituous Cordials*, (for such indeed all proper Cordials are) as *Brandy*, *Dr. Stephens's Water*, and such-like, having *sulphureous Particles* so prepared and disposed towards *Heat*, or *Fire*, that they are as it were in *Potentia proxima* (or next *Disposition*) thereto; are mighty apt to contract a *Heat*, as you find by *Spirit of Wine*, or *Brandy*, kept the least time in a warm Place, or (to come closer to the matter) in your Mouth; wherein being actuated by its *Heat*, they will as in an instant grow so hot and active, that you can hardly bear them, because *Particles of Heat* which penetrate any *Metal*, *Glass*, &c. immediately as soon as applied thereto, will much more easily and sooner penetrate our soft Parts at Mouth, or the *Crusta Carnosa* at Stomach, and so reach the most *sensile Coat* thereof, *pleasing*, *comforting*, and *exciting* the *Spiritus insitos* as in a moment by their *spirituous Heat*, which we actually feel and sensibly find to please and comfort the Stomach.

But if some *Purging Tincture* had been put into the Cordial, or *Brandy*, this would not have soaked through the *Crusta Carnosa* under some time, and consequently not operated till it had. This may be most manifestly illustrated by some *hot Brandy*, or indeed any hot Liquid put into a porous Dish set upon one's Hand, which presently warms it; but if the Liquid be tinged with any thing, that *Tincture* will not reach the Hand, till the Liquor, which is its *Vehicle*, soaks through, which may be in an Hour (more or less) according to the Porosity of the Wood, which *Tincture* is to be compared to the *Purgative* at Stomach.

Hence it follows, That all Cordials should be a *spirituous Liquid*, if intended for sudden *Refreshment*, which Experience has taught, and be given actually warm'd, if a very nimble Comfort be required; tho,

tho' the great *Heat* of the *Stomach*, above that of the *Mouth*, will generally be sufficient. Thus may the *Stomach* be pleased and comforted, grieved and purged, with the same *Draught*; but *Gracious Providence* has given the *start* to the *Cordial*, which immediately comforts us as a *Heater*.

30. If *Opium* operated by such *Fumes*, it would (at least in a *liquid Form*) begin its *Operation* as soon as it is at *Stomach*; for it would begin to send up *Fumes* as soon as it began to be warm, which is presently, and be at a very considerable *Height* of *fuming*, and consequently of *Operation*, in one *minute*, which is about the space of seventy ordinary *Pulses*; but we do not find it begin to operate in that *Form*, under twenty, thirty, or forty *Minutes*, which is much about the *time* that a more agreeable, and not nauseated *Vomit*, or *Purger*, begin to affect the *sensile Coat* of the *Stomach*, and give intimation of their so doing. All which, and the *Sense* of *Pleasure* that we actually then feel at *Stomach*, makes it probable that it operates by affecting the *Stomach* pleasantly and comfortably, (after the manner of generous *Wine*) as *Purgers* and *Vomatives* do by affecting it grievously, all of them (except the *Wine*, that pleases and comforts sooner because of its *Particles* of *Heat* gain'd by *Fermentation*) operating much in the same *time*, because they take like leisure to soak through the *Crusta Carnosa* to the *sensile Coat* of the *Stomach*.

31. All sensitive *Pleasure*, *Comfort*, &c. are received by the *Senses*; and though any *Part* were some way benefited, that has no *Sense*, no *Comfort* would be perceived; without *Perception*, none could say that he is comforted: What fitter *Part* is there to be pleased, and comforted by *Sensation*, than the *Stomach*? which has such exquisite *Sense*, that it can discern the *vomitory Particles* in
Infu-

Infusion of the *Crocus*, or *Regulus* of *Antimony*, which no *Sensation* but that at *Stomach* can discern; and so small, that a thousand *Vomitories* made thereof by *Infusion*, do not sensibly diminish the *Crocus*, or *Regulus*, as to *Weight*, or *Bulk*; nor can I conceive where any sensible *Comfort* can be perceiv'd by a spoonful of *Cordial* but at *Stomach*, where it actually is, and upon whose *Coats* it immediately insists; Is it not there that we feel the *Comfort*? and where should we find it but there? What would the *Effluvioms* of a Spoonful signifie, if mix'd with 100000 times as much *insensible* *Bloud*? and what Part (besides the *Stomach*) that the *Bloud* touches, can be sensible of it? So that if *Effluvioms* were granted, 'tis thither they must return to cause any considerable *Pleasure*, or *Comfort*: But what need any *Return* of the inconsiderable *Effluvia*, when the main *Body* of the *Cordial* (yea, all) lies upon the *Stomach* already?

I must forbear running into the *Business* of other *Chapters*, having been tedious enough upon the Subject of this, and the rather, because it was so general and so rooted an *Opinion* in the Minds of *Men*, in all *Ages*, and in all *Seets* of *Physicians* and *Natural Philosophers*, that I could not say too much to endeavour to free the *World* from the *Slavery* of such an *Imposition*, and the innumerable ill *Consequences* of such a fundamental and overgrown *Errour*.

Which certainly must have been long since exploded, if ingenious *Men* had first thought, and then spoke freely; but the *Truth* is, there were many and great *Causes* to the contrary, as those intimated in the last *Paragraph*, and the mighty *Usefulness*, and ready *Officiousness* of that *Opinion* of *Fumes*, to answer for all the more obscure and latent *Causes* of the *Maladies* and *Disasters* of the
Brain

Brain and *Genus Nervosum*. If any enquired or called for the Cause of a *Vertigo*, the *Physician* answered (*Fumes*;) of *Epilepsies*, it was answered (*Fumes*;) of *Scotomies*, it was *Fumes*; of *Head-achs*, *Megrims*, *Comas*, *Caros*, *Lethargies*, &c. it was *Fumes*; of *Hysterick Fits*, *Convulsions*, *Spasms*, *Cramps*, &c. it was *Fumes*; nay, they answered as Causes to all *Distillations*, *Catarrhs*, *Epiphora's*, (or weeping *Eyes*) and all, even ordinary *Tears*; all which they said were only these *Fumes* turn'd into *Water* by the Coldness of the *Brain*, as they are in a *Still*, or *Alembick*; so hot *Fumes* accounted for *Phrensies*, *Deliriums*, *Ravings*, &c. So that however other *Heads* were, the *Physician's* was stuff'd therewith; and all *Meteors* of the *Microcosm's* Upper Region, whether hot or cold, were (as those in the *Macrocosm*) formed out of *Fumes*, as he imagined.

Thus you see all the *Opinions* and *Hypotheses* that have been, concerning the Operation of *Opium*, to be most absurd, and directly contrary to all *Sense*, *Reason*, and *Experience*.

C H A P. XI.

Opium does not diminish or disable the Spirits by any means whatsoever.

HAVING sufficiently demonstrated, that Opium cannot diminish or disable the Spirits by the cold Quality of the Ancients, or Fumes of the Moderns, and that neither of them have as much as any Being; I shall now add, that Opium does not diminish, or disable the Spirits by any other means whatsoever.

I would not be mistaken, when I say, That Opium does not diminish, or disable the Spirits by any means, (for there is nothing so good in Nature, but will do it, if used unduely, or immoderately, as Wine, Bread, Milk, Honey, Sugar, Beer, &c. in excess) for I intend, that it does not do it when duely and moderately used.

1. That which refreshes the Wearied, and highly prevents Weariness, must add to, or excite the Spirits, which is directly contrary to diminishing, or disabling them; but Opium does in a most eminent manner refresh the Wearied, and prevent Weariness, therefore it does not diminish, or disable the Spirits.

Some have been so silly, and inadvertent, as to object, that it refresh'd the Weary only by Sleep; It is Matter of Fact, that it refreshes them whether they Sleep, or no, and that without failing as often as it is used in that Case.

Others (that were no Wiser) have said, that it only took off the *sense* of *Weariness* by stupifying, which happened by the *diminishing*, or *disabling* of the *Animal Spirits*. Bare Insensibleness cannot enable the Spirits to *Labour* with eminent *Briskness* and *Alacrity*, as Men most certainly do after *Opium* is taken, being finely *enlivened*, and *invigorated*, as with *generous Wine*; if they do not know this to be true, let them for shame hold their *Tongues*, till they know *Matter of Fact*, which if they will not, they proclaim themselves to be *idle* and *impertinent Babblers*; but if they will patiently and wisely abstain arguing, till they are satisfied as to *Matter of Fact*, then will they be past *Opinion* and *Hypothesis* in that Case; for they will have sensible and certain *Knowledge of the contrary*, and the *Truth* of what I say; which will end all *Controversy*, and *precarious Squabbles* upon false *Suppositions*, (as the manner is) that cannot lead them to what is *Right*, but by meer chance, and never to a true *Knowledge*, that they are in the *Right*, which makes it none in effect; for they can do nothing with *Affurance*, but only suppose, and hope they are in the *Right*, when they are as much out (to their Patient's sorrow) as *Physicians* have been in the *cold Quality*, and *Fumes* of *Opium*.

It is true, that a *Grain* (or *Two*) of *Opium*, will, if a Man composes himself, *sitting*, or *lying still*, cause a *Sleepiness*, equal to that caused by spending the *Spirits* by a *Day's Labour*; but spending of the *Spirits* is not the only, no, nor best proportioned, or more adequate cause thereof, (as I have shewn:) If loss of Spirit were the adequate cause of *Sleep*, how should good and generous *Wine* cause *Sleepiness* after that eminent Rate as it does in most People? How should the most
pleasing

pleasing Musick incline such as *lie*, or sit *still*, to sleep? but if one Dances thereto, it makes him more lively and brisk than ordinary. The like exactly do *Wine* and *Opium*, if Men *lie*, or sit *still*; but otherwise, they make them much more brisk and lively, and able to undergo *Labour*, *Action*, &c. Which Note, that you may not any more wonder, that *Enliveners* and *Exciters* of the *Spirits* do cause *Sleep*, as well as *Diminishers* thereof; and observe, that they are all pleasing things, as *Musick*, *Wine*, and *Opium*, which cause *Pleasant Dreams*, *Pleasant Watchings*, *Pleasant Humours*, &c. Expect more of this Matter in the following Chapters, and all by *degrees*, according as I Judge the prejudiced *World* will bear Things: For a great *Paradox* (how true soever) must not be abruptly obtruded, but *gently*, and *gradually* ushered in by insinuating *Reasonings*, otherwise it will be entertained like a rude *Stranger*, that contradicts a *Multitude* in *Fashions* and *Customs* that they have always used, and judged to be the very best (however blameable.)

Consider, that if *Opium* diminished or disabled the *Spirits*, proportionable to the *Sleepiness* that it causes, as a hard *Day's Labour* does, then if *Opium* were given a Man after a hard *Day's Labour*, it would be, as it were, adding another hard *Day's Labour* to cure it, the *Day's Labour* and *Opium* impairing the *Spirits* alike; Think what a miserable Condition the poor Man would be in, especially if *Sleep* did not make him some amends, it would be such as were utterly intolerable; but so far is *Opium* from any such *Effect*, that it refreshes him tho' he *Sleeps* not at all after the hard *Day's Labour*, and not only so, but will enable him to *Work* all the following *Night* with great *Alacrity*, if need requires it.

What a *Condition* would those be in, who take a *Drachm* of it twice a day for 10, 20, or 30 years? Nay, how could any possibly do it for half 10 days, if a *Grain* or Two destroyed the *Spirits* so much, as to cause *Sleepiness* thereby, as *hard Labour* does? Which they must allow, that assert it causes Sleep by *diminishing*, or *disabling* the *Spirits*.

But some may say, (tho' very inconsiderately) that it only *disables* them for the *time* of its Operation; That is strange, indeed, considering that even during that time they are mostly enabled to *Work*, or *Labour*, tho' tired before; and that it,

2. Causes *Comfort*, *Refreshment*, *Ovation* of the *Spirits*, all the *time* of its Operation, as *Wine* moderately taken does, especially if People keep themselves in *Action*, *Labour*, &c. otherwise, indeed, they may fall asleep upon the comfortable *satisfaction*, *contentation* of Mind, and *acquiescence* of Spirit, that it occasions, as *Wine* does.

3. The *first Effect* that we find of *Opium* (which may therefore probably be a very *leading*, *fundamental*, and *significant Effect*) is, that it causes a most agreeable, pleasant, and charming sensation about the *Region* of the *Stomach*; which if one lies, or sits still, inclines him to Sleep, if not, it makes him gay, good humour'd, brave, &c. It is a *Pleasure* so sweet, and *delicious*, that tho' I endeavour'd to express it by the *Ovation* of the *Spirits* upon Joy, a good *Genius* informing a Man, or the *Helmonstians* *Archens* in his best *Humour*, or a continual *Veneréal Pleasure*, *Wine* drank ad *Hilaritatem*, &c. yet (I doubt) all my Ways of expressing it do come short of the charming *Complacency* that it causes; Therefore if *Wine*, *Musick*, a good *Meal*, agreeable *Frication* of the *Head* or *Back*, the sound
of

of Waters, &c. do incline us to Sleep by the Pleasure thereof, which lulls and sooths us to it, (as is most certain, if we sit, or lie still) much more must the high Charms of Opium cause it.

That it is a Pleasure that affects by one of our Senses, namely by Feeling, is indisputable; for it is not a Pleasure of the Eye, Nose, Tongue, or Ear, and it must be sensitive, because caused by Matter; and that Opium has (doubtless) the like Effect upon Brutes, who have no other Pleasure, but what is sensitive; That it is at Stomach is also evident, where we can be pleased only by the Sense of Feeling; That it is involuntary, and pleases us whether we will or no, and that the same Particles excite Venery, Itching, &c.

Now all the Senses (especially Feeling, and particularly that at Stomach) are given us for Watches, and Sentinels, to discover and give notice of what is, or is not good and agreeable to our Animal Nature; That upon notice of what is good, and agreeable, Pleasure, Comfort, Satisfaction, &c. are conceived; otherwise Displeasure, Discomfort, and Dissatisfaction.

What diminishes or disables our Spirits, does us the greatest Evil that can be, and consequently Sensation would, according to its Office, give us such notice thereof as would cause Displeasure, &c. otherwise these Sentinels, that God and Nature have appointed for faithful Notice, would (instead of trusty service, which is the End they are made for) deceive us, and consequently do us mischief, rather than good; which is very Profane (if not Blasphemous) to assert, as being highly abusive of God's Goodness and Wisdom, to make Things in Nature, that would not only not answer, but

act quite contrary to their *Ends*; it follows then, that what causes such a mighty agreeable, and pleasant *Sensation* at *Stomach*, which is the greatest, and most accurate Judge of what is, or is not agreeable to the *Animal*, cannot be destructive, or disabling of its *Spirits*, which are the most excellent, and useful Things, that belong thereto; Therefore *Opium*, which so mightily recommends it self to, pleases, and comforts the greatest Judge that God has given to a sensible Creature to discern what is good and evil for it, cannot diminish or disable our *Spirits*.

One may say, (what I dare not) that the *Sensation* at *Stomach* may deceive us.

We may deceive our selves, and say so, when that which pleases the *Stomach*, does not please our perverted *Imagination*, which makes no *Argument*; let us therefore consider Things where there is no such vain *Imagination* to contradict the good *Ends* of Nature; if the *Stomach* and Senses in a *Brute* or meer *Animal*, which has no other means to Judge of what is good or evil for it, should not Judge aright, all the *Animals* in the whole World would soon perish. It is the vain Opinion of Men that perswades them that Things are cold, when hot, &c. as in the Case of *Opium*, when the Senses truly inform that it is hot; If you'll stand to your *Imaginations*, and *Suppositions*, (for such all must be without the *Information* of Sense) against the *Dictates* of *Sensation*, you must inevitably err.

But one may say, Is the Sense at *Stomach* such an infallible Guide always?

I believe it will be very hard to give many *Instances* to the contrary, and prove it well; however, if we do, or may allow something of this *Kind* to a perverted *Stomach* at certain *times*, (to avoid a *squabble* about it) it is never to be allow'd, That all the *Stomachs* in the *whole World* should be pleas'd with one and the same Thing at all times, and yet that this Thing should be so highly pernicious to the *Animal* as to *diminish* or *disable its Spirits*; Then, indeed, it would follow, that the most exquisite Sense at *Stomach*, to discern what is or is not agreeable to the *Animal*, were absolutely in *vain*, which no Man of *Reason*, that has any Apprehension of the Wisdom of God and Nature, can assert.

3. What is more notorious, than that *Pleasure*, or being pleas'd, raises, and *Displeasure*, or being griev'd, depresses the Spirits? Are not all People *pleasant, gay, and good humour'd, brisk, prompt, &c.* when pleas'd? Do not Men Travel, or Labour with more *Ease* in *Pleasant Company, &c.* But of these Matters, and the Reasons thereof, more in the following Chapters.

4. How can *Opium*, that revives People when they are so dispirited that they are even almost dying, (as when *Opium* is wanted by such as use to take it in *Deliquiums* and *Agonies* from Pain, &c.) *diminish, or disable the Spirits*? It is plain *Contradiction* to say that it should.

Next to *Opium*, nothing revives People in such Cases better than *Wine*, and those Things that produce the same, or like Effects, have like Nature; and who can say that *Wine*, that was made to glad the Heart of Man, *diminishes or disables the Spirits*? Or, that *Opium*, which produces all the *sprightly, enlivening, and encouraging Effects* of generous

nerous Wine, (in a more eminent manner than Wine, and in the 10000th Part of its Quantity, and for a longer time than Wine causes them) should diminish or disable the Spirits?

For Instance, *Wine and Opium, in a due quantity, (but Opium, in a far less quantity, as was said) cause a pleasant, gay, and good Humour, Courage, Bravery, Magnanimity, Promptitude in Business, Expediency in Management, Serenity, Euphory, or easy undergoing of Labour, Journeys, Fatigues, &c. Both take away Sadness, Grief, Melancholy, Fear, Depression of Spirits, &c. Both cause Promptitude to Venery (Sine Cerere & Baccho friget Venus:)* So *Wine and Opium prevent and cure Cold, open the Pores, promote Perspiration and Sweat, especially the following Mornings, as Sir Theodore Mayern, my self, and others, have observ'd of Opium, and is notorious as to Wine. Both cause Sleep, and take away the Sense of Pain, and require a greater Dose than ordinary in Proportion to the Pain; Both take off Shiverings from Fear, Cold, or Ague Fits, and cause Mirth, Contentation, and Acquiescence, Driness of the Mouth, Thirst, a Sense of Heat within us, a Dreaming Condition, pleasant Dreams, (if the Quantity of Wine be not grievous by its Heat, Load, &c.) Nocturnal Pollution, and in some Constitutions both cause Vigilancy; but Wine and Opium cause that more rarely than Sleep: Both stop, and cause Vomiting if they stay too long at Stomach; Both moderate Hunger, (Λιμὸν ὀνόμηνει λύει) and are good in a canine Appetite; Both cause Swimming in the Head, &c. So*

Both in an Excessive Dose,

Do cause, at first, Mirth, and afterward a kind of Drunken Soper in some, in others Fury, or Madness,

of Opium Reveal'd. 89

Madness, Sardonick Laughter, and Weight at Stomach, Vomitings, Hiccoughs, great Heat at Stomach, Debility, and laxity of all Parts, Faltering of the Tongue, Scotomies and Darknes of the Eyes, Vertigo's, Laxity of the Cornea of the Eye, Dilatation of the Papilla, Deadness of the Eyes to the View, Loss of Memory, Venereal Fury, a high Colour, profuse Sweats, Purging sometimes, Alienation of the Mind, Loss of Memory; and lastly, greater or lesser Effects according to the Dose, Constitution, &c. So

A long and lavish Use of both,

Causes a dull and morpish Disposition, Dropsies, Fall of Humours upon Weaken'd Parts, a Sleepy Disposition, Want of Appetite, Weakness of Digestion, Aptitude to Sterility, and Abortion, early Decrepiteness, Stooping in the Back, Trembling of the Hands, Weakness of Memory, Shortness of Life, Difficulty and Danger in suddenly leaving them off, Revive such as sink for Want of either, and supply the Want of each other.

How can any have the Face to say, that a Thing which agrees so with generous Wine in Effects, can be a Diminisher or Disabler of the Spirits? The Mischiefs of excessive Doses, and lavish Use of either, is no Argument against their inspiriting Nature; if it were, then Wine is no Cordial, tho' made to glad the Heart of Man, because of its ill Effects lavishly used: Therefore none can argue from that, that Opium diminishes or disables the Spirits, any more than Wine, or Bread does, a Surfeit of which is most dangerous. *Omnis Repletio mala, Panis vero pessima; & corruptio optimi est pessima:* That is, *All Repletion is bad, but that of Bread is the worst; and the Corruption of the best is the worst.*

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The short is this; *Wine* and *Opium* agree in all their *Effects*, saving such as are Consequences of their *different Accidents*, as the Quantity of *Wine* that must be used to cause the same *Effects* with a little *Opium*; and *Wine* having been fermented; and *Opium* (as may be shewn) having some *crude* and *viscid Rosin* in it, which sometimes sticks to the *Crusta carnosæ*, &c. of the Stomach; whence it happens, that *Wine* loads one more, heats more, and is more troublesome upon those *Accounts*, and that *Opium* offends the Stomach oftner even in a moderate Dose, causing *Vomitings*, *Hiccoughs*, *Anxieties*, *Distresses* at Stomach, *Deliquiums*, &c. because of the *indigestible Rosin* sticking to the sides of the most sensible Stomach, as I shall farther prove hereafter, (by God's Help) shewing very easie *Ways* and *Means* to separate that *Rosin*, and so make it as safe, and less troublesome, as it is more effectual than *Wine*.

Opium cannot diminish or disable the *Spirits*, because (as has been proved) it sends no *Part*, *Fume*, or *Effluvium* to the Brain, or *Animal Spirits*, to cause such bad *Effects* while it is at Stomach, yet does it produce them while it is there; for, as the *Vaporarians* themselves (and indeed all Men) allow, there can be no *Destruction* without *contact*.

Sanctorius doth well and truly observe, by the Help of his *Statics*, that nothing causes *liberal Perspiration*, but it raises the *Spirits*; it is most certain, that nothing in Nature opens the *Pores*, and causes *Perspiration*, more than *Opium*; Therefore nothing should, according to his *Observation*, elevate the *Spirits* more, and, indeed, nothing does, as appears by all that has been said, and will yet more plainly appear.

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Loss of Memory by *Opium* (as some argue) is not so much a *Loss of Spirits*, as *Lanity* of the *Brain*; for People in Drink do not want *Spirits*, but there is a great *Relaxation* of the *Brain*, and its *Membranes*, and of the whole *Fenus Nervosum*, which *Relaxation* causes a soft, loose, and labile *Brain*, that like Liquid Things retains no *Impression*; besides, that I shall (*God willing*) shew you hereafter, that *Impressions* cannot be so well made upon the *sensitive Soul*, by the *Animal Spirits*, upon *Relaxations* of the *Sensible Parts*, as in *Sleep*, &c. for a very plain *Mechanical Reason* to be shewn in due time.

Thus have I, (by the *Assistance* of its *M* who best knows it) cleared *Opium* from the *Aspersions* of an extreme *Cold Quality*, and *Parco-tick Fumes*, both which were commonly call'd *Venemous*, *fatal*, and by all the *ill Names* imaginable, but (as good Luck is) they abused nothing; because 'tis manifest, that there is no such Thing, nor has it any *Quality* by which it *diminishes*, or *disables the Spirits*, as is most evident from the *Premises*, so that all that has been said of *Opium*, by way of *Hypothesis*, to explain its Effects, depending upon its *diminishing or disabling the Spirits* by a *Cold Quality*, or *Fumes*, is come to nothing, I wish it had been as innocent.

C H A P. XII.

Shews what must be the true Cause of the Operation of Opium.

ALL the general Foundations upon which Authors, either Ancient or Modern, erected their several Hypotheses concerning the Operation of Opium, having (as manifestly appears) no real Existence; What Enchanted Castles in the Air, or vain Phantasms, must their Structures be? And, how like deluded Wizards must they appear, when they seem'd to take high Flights and glorious Prospects of Causes that had no Reality?

Thus am I left utterly destitute of either Foundation or Model, unless I find out that, and frame this; which (I hope) may be easily done, because (the cloudy Supposition of Vapours having vanished away) there now remains but Two Ways by which an Internal Medicament can Operate, viz.

1. As an Alterative of the Blood, &c. Or,
2. As affecting the Sense of Feeling, either grievously, as Vomits, Purgers, &c. Or pleasantly, as Cordials, generous Wines, titillating Amphrodisiacks, comfortable Warmth, Anodynes, and such like, that please the Nerves and Membranes; which way of Operating is too little observ'd by Physicians, tho' they take great Notice of the Operation of Things by grievous Sensation, as Irritatives to Vomit, Purge, Salivate, &c. by their Acrimony; whereas the Pleasers of Sensation, which must, as Contraries, have contrary Operations, are little regarded, or thought of.

I. Opium

1. Opium does not Operate as an Alterative of the Bloud, &c.

First, Because it Operates while it is at *Stomach*, or (at least) before it arrives at the *Bloud*; which manifestly appears several *Ways*; as,

1. Because it often Operates in a *Liquid Form* in few *Minutes*, and very commonly in a *Quarter* of an *Hour*, in which time it must be at *Stomach*, or, at least, far from arriving at the *Bloud*.

2. Because it has been very often Vomited up after it has Operated, and produced its usual *Effects* for 1, 2, 3, 4, 5, 6, 8, 10, and sometimes more *Hours*; as evidently appear'd by the *Smell*, *Colour*, *Taste*, &c. of what was Vomited; and by its *Operation* ceasing after such *Vomiting*; of which common *Experience*, and *Authors*, do inform us: See *Helmont Jus Duumvir. 62.* where he tells of *Opium* Operating at *Night*, and Vomited up next *Morning*.

3. Its bare causing Vomiting after it has Operated for a good while, is of it self (tho' its *Taste*, *Smell*, &c. did not discover it) an infallible Argument of its Operating, while it is at *Stomach*; for 'tis against all Reason to imagine, that Things should irritate it to Vomit after they are gone into the *Bloud*, and not do it while they are in the *Stomach* it self, as all *Vomitories* do.

The Reasons why it stays so long at *Stomach*, are, 1. Its *Indigestibleness*, which plainly appears by *Stools*, *Urine*, and *Sweat*, smelling of it, when taken in any considerable Quantity; all the *Cockitions*, *Digestions*, *Circulations*, &c. that it passes in the Body, signifying very little to it, which its causing *Itchings* in the Skin, and affecting the *Vener*
nereal

nereal Membranes after its passing the Blood, do also argue. 2. The clamminess of its resinous Parts sticking to the *Stomach*, cause (as I shall plainly prove hereafter) its long stay in it; for if the *Resin* be separate from it, 'twill not then make such a long stay at *Stomach*, as I have often Experienced.

4. We actually feel it causing a sense of *Pleasure* at *Stomach* during its Operation, therefore it is then in it.

5. It has been carried off by *Stool* after it has produced its usual Effects; Therefore it Operated before it arrived at the Blood.

6. All Observers do allow, that *Opium* Operates while it is at *Stomach*; which gave the Occasion (as you may remember) to the *Hypothesis* of its Operating by *Fumes* rising out of the *Stomach*; because they could not think of any other Means by which it might affect the *Head*, *Brain*, *Animal Spirits*, *Nerves*, &c. while it was at *Stomach*, but by the Way of *Fumes* or *Vapours*.

It is therefore past all doubt, That *Opium* produces its common Effects while it is at *Stomach*, and before it arrives at the Blood, and therefore does not Operate as an *Alterative* thereof.

Secondly, Because a Grain of *Opium*, which Operates very remarkably, bears (as *Etmuller* well observes) so small a Proportion to the Blood, that it cannot produce such great, and notable Effects, as an *Alterative* thereof; for a Grain of *Opium* to 20 Pound of Blood, (which an ordinary Man has in his Body) is but as 1 to 115200, or (if 16 Ounces be allow'd to the Pound) as 1 to 153600. But it is no Wonder if a Grain should affect the *Membrane* at *Stomach*, since the

1000 part of a Grain of the *Vomitory Particles* of *Crocus Metallorum*, or *Regulus of Antimony*, does affect it so eminently, as many other Things will in a very small Quantity; whereas the altering of the Blood to any observable degree, requires the Use of *Alteratives* in great Quantity for several Weeks: Which confirms the former Conclusion, That Opium does not Operate as an *Alterative*, as to its common and usual Effects.

II. Opium does not Operate by grievous Sensation, (or Irritation) as Vomits, Purgers, Errhines, Salivators, (or Apophlegmatizers) &c. do.

First, Because it manifestly causes a very agreeable, pleasant, and even charming Sensation.

Secondly, Because it takes away grievous Sensation or Pain, thereby stopping Vomiting, Purging, and all other Effects of grievous Sensation, by *Acrimony*, &c.

As for the Vomiting that Opium sometimes causes, it is only (as shall be shewn) by its Resinous Parts sticking to the Coat of the Stomach, which being separated from it, Opium has no such Effect, tho' all its good Effects remain. So its Purging (which happens most rarely, and only when a great Quantity is given to Men of strong Digestion) it is only from its Rosin digested, and resolved in strong Stomachs; Hence it is that Dogs, and such as have canine Appetites, do generally Purge after a great Quantity of Crude or Rosinous Opium; whereas such as is not Rosinous causes no such Effect. But of these Matters more to your Satisfaction hereafter.

Thirdly, Because it causes all Effects that are quite contrary to those of grievous Sensation; It causing

causing an *Ovation* of the Sensitive Soul and Spirits ; *Pain* (or grievous Sensation) a *Depression* of Spirits ; It causing *Euphory* and *Pain*, *Weariness* ; For what tires more than *Pain*, or labouring in *Pain* ? It causing good *Humour*, *Pain* *Peevishness*, *Fretfulness*, and ill *Humour* ; *Opium* causing *Relaxation* of all Parts, *Pain* *Contraction* ; *That* causing free *Perspiration*, *this* checking it ; *That* causing *Sleep*, *this* hindering it ; *That* causing *Contentation* *Acquiescence*, *this* *Discontent* and *Uneasiness* ; *That* composing, *this* *discomposing* the Spirits, *Bloud*, &c. *That* causing *Fluxes* by *Irritation*, &c. *this* moderating, or stopping them ; *That* opening the Pores, *Pain* constringing them ; *Opium* preventing the Shaking Fits in *Agues*, *Pain* bringing them on ; *That* causing a large and slow Pulse, *this* a quick, hard, and narrow Pulse ; *That* causing an *Efflorescence* of the Skin, *this* *Paleness* ; *That* pleasant, *this* unpleasant *Dreams* ; *That* stills *Hiccoughs*, *this* causes them ; *That* takes off *Contractions*, *Convulsions*, &c. *this* causes them. To be short, *Opium* causes all the Effects of pleasant Sensation, and takes off all the Effects of grievous Sensation. What can be a more evident Proof of its acting by causing a pleasant Sensation ? It were endless to mention all the Proofs that may be made to the same Purpose, from Pleasers and Displeasers of Sensation.

Therefore we fairly conclude,

That Opium does not Operate by causing a grievous Sensation, and there being no other Way left by which it may Operate,

It must Operate by causing a pleasant Sensation ; which is the true and plain Reason why (as has been shewn) it takes off Pain, and causes all Effects quite contrary to that of grievous Sensation ;
Irrita-

Irritations by Acrimony, &c. which are most eminent upon the most sensible Parts, as the *Stomach, Intestines, Venereal Membranes, Skin, &c.* as you may observe where the Effects of *Opium* are enumerated.

Now (*gentle Reader*) consider, That *Contraries* are the true Cure of *Contraries*: What can then cure Pain, and all its Effects, better than *Pleasure*? 'Tis very strange then, that *Millions* for many Ages finding *Opium* cure, or take off Pain, and all its Effects, above all Things, should not attribute its so doing to its causing a pleasant Sensation, which is the direct contrary to Pain, especially since every Man that took *Opium* felt an actual *Pleasure* upon taking thereof, pleasant Dreams, a pleasant Humour, &c.

It may be said, What if it be granted, that *Opium* Operates by a pleasing Sensation, (which I will Thank none for, that have Feeling at Stomach, or Reason at Brain) how is it possible that such pleasant Sensation should cause and explicate all the various, strange, wonderful, mysterious, and very often seemingly contradictory Phenomena's and Effects of *Opium*?

Answer. As easily as ever I explain'd any Thing in Nature, especially if my *Tract of Animal Mechanism* were published; but it is my Misfortune that it is not, however it shall not be the Readers, tho' it will put me to a great Trouble; To evade which, is none of my Intention, by those Words, but rather to bespeak the Reader's Patience while I am premising some necessary *Præcognita* requisite to be known before I enter upon the Explication of the wonderful and seemingly inexplicable Effects of *Opium*.

I therefore desire the *Reader's Leave* to premise some Things of the *Nature of Sensation*, and *sensitive Pleasure*, in order to his more clear and ready Understanding my Explication of this *Mysterious and Momentous Matter*, look'd upon as so dark and abstruse a Business to this day, that some have not only yielded it up as a Thing hidden from Mankind, but have earnestly and seriously argued, that it acted absolutely by an *occult Quality*, reserved in a special manner (as is the Nature of Spirits) from our *Knowledge*.

That it has been so hitherto, I think none can deny, as the *Circulation of the Blood* was for *Thousands of years*, tho' the very *Motion* was seen by *Millions*; so as the Cause of the Operation of *Opium* has been felt by a far greater number, it therefore will (if I fail not in explaining it) appear so clear, that it will be much wondered at (like that of the *Circulation of the Blood*) why so obvious a Thing was not found by every one that used *Opium*. But (whatever *Opium* is) God's Methods are unsearchable, and often his Wise Providence bestows good Gifts upon the Unworthy, that his free *Goodness* may appear; To whom be all *Glory, Praise, and Thanksgiving* for ever and ever. *Amen.*

Note, That while I am upon the Preparatory Discourse about *Sensation, Pleasure, &c.* in the following Chapters, you may sometimes wonder what I would be at, because you may not perceive the *Drift*, yet do they require your *Attention* as being the *Foundation* of all that is to follow; which you'll plainly perceive afterward, when (I hope) you'll have good *Satisfaction* for your patient and attentive Perusal of the Two following Chapters.

CHAP.

C H A P XIII.

Of the Oeconomy of Sensation, as far (at least) as it concerns our present Purpose.

WHEN I had written this *Tract* thus far, I judg'd it best, first, to publish that of *Animal Mechanism*, because it contained those *Principles* that would explain the Matter of *Opium*; therefore laying this aside, I applied my self to that: But a *New Art*, rightly to *Spell*, *Write*, and *Sweeten* all *Languages*, (that I since call'd *Phonography*) coming into my Mind, and thinking it might be very useful, and likely to lie for ever in *Darkness*, (as it had always been) unless I undertook the *Drudgery*, I set my self to it; which taking up more *Time* than I imagined, has to this day hindred the finishing of that *Tract* of *Animal Mechanism*, which I now much want, (as was intimated:) Therefore because I resolv'd to publish this, (that was so long since promised) I am now forced, for want of that *Book*, to premise here some Things, concerning the *Oeconomy* of *Sensation*, and the *Nature* of *sensitive Pleasure*, in order to explicate the *Effects* of *Opium*, which might have been spared, if that of *Animal Mechanism* had been published.

Considering that *Opium* must (as was shewn) operate by pleasing the *Sense* of *Feeling*, it will be requisite to consider,

I. *The Oeconomy of Sensation, as far as it concerns the present Purpose, for which this Chapter is design'd.*

II 2

2. *The*

2. *The Nature of sensitive Pleasure, and its Effects upon the sensitive Soul and Body, which is to be the Subject of the following Chapter.*

Five Things mainly concern the *Oeconomy of Sensation*: 1. *The Object.* 2. *The external Medium.* 3. *The Organs of Sensation.* 4. *The Animal Spirits, (or internal Medium.)* 5. *The sensitive Soul.*

1. *The Object is the Thing perceiv'd by any of the Senses; as, Light by the Eye; Sound (or tremulous Motion of the Air) by the Ear; Odour by the Nose; Tastes by the Tongue; Opium by the Feeling, or (as Helmont calls it) the Gustus (or Taste) at Stomach.*

2. *The External Medium of Sensation is that which receives Impressions from the Object, and conveys them to the Organs of Sensation. Thus the Air conveys Sound (or tremulous Motion) to the Ear, Light to the Eye, and Odour to the Nose.*

3. *The Organs are the Parts of the Body that God has fram'd to receive those Impressions, and communicate them to the Animal Spirits, (or Internal Medium.) Thus the Eye is the Organ to receive the Impression of Light, the Ear that of Sound, &c. And the Membranes in all Parts of the Body are the Organs that receive Impressions from Objects in the case of Feeling, which is our main Concern.*

4. *The Internal Medium is the Animal Spirits that receive the Impressions from the Organs, and convey them to the Sensitive Soul.*

5. *The Sensitive Soul, which perceives those Impressions convey'd to him by the Animal Spirits; which Perception is Sensation.*

1. *The Part, Office, or Business, of the Object, in the Matter of Sensation, is to make a sufficient Impression either upon the External Medium, (or Air) as in the case of Hearing, &c. or immediately upon the Organ, (or Membrane) as in Feeling, &c. Therefore if there be no Impression of Light, Sound, (or tremulous Motion) Odours, Relishing Particles, &c. there can be no Perception; or if the Impressions thereof be weak and faint, the Perception, or Sensation, must be accordingly; or if it be so inconsiderable, that it cannot at all affect the sensitive Soul, then is there no Perception thereof.* For,

1. *Sensitive Perception is not infinite, because there are Degrees of Light, Sound, &c. that cannot be perceiv'd, tho' they must be very small, and inconsiderable: Thus the Light of a Candle at so great a distance that it can hardly be perceived, is some Degree of Light, and makes its Reflection proportionably from a Wall, Tree, &c. yet cannot that reflected Light from the Wall, or Tree, be perceived; so the smallest Things cannot be perceived. Yet GOD has in His Wisdom and Goodness so ordered it, that,*

2. *Sensitive Perception is of excessively small Things: Thus the Sound of a Pin's Head, falling into a Brass Caldron, is heard at some distance; the hundredth part of a Grain of very hot and biting Things, are sensibly tasted; the thousandth part of a Grain of Ambergrise, Musk, &c. very sensibly smelt; the Light of an exceeding small Spark, struck out between Steel and Flint, is perceived at a great distance: And Light in general consists of such tenuous Particles, (if material) that none ever could take any estimate of their Bulk. So the Feeling at Stomach takes very eminent and remarkable*

able notice of (as was said) the *Vomitory Particles* of *Crocus Metallorum*, or *Regulus of Antimony*, which are so small, that a thousand Vomits thereof does not sensibly diminish the *Crocus*, or *Regulus*, either in weight or bulk. Therefore it is no Wonder if a Grain of *Opium* should affect the Feeling so sensibly as it does, especially at *Stomach*, tho' it cannot make any considerable *Alteration* of the *Bloud*.

3. That whatever affects, or makes impression, upon the Organs of Sensation, is in the same moment perceived by the sensitive Soul: So that it is no Wonder, that a Grain of *Opium* operates in so short a time, that is, as soon as a *Tincture* thereof insinuates it self through the *Crusta Carnosa* to the sensible Coat of the *Stomach*; whereas it must take a very long time, if it operated as an *Alterative* of the *Bloud*.

Now Note, 1. That there is no way for any thing to operate upon the sensitive Soul, in so small a Quantity, as *Opium* operates, or in so short a Time, as by affecting the most exquisitely disposed Membrane at *Stomach*. 2. That the speedy Way that God has contrived for our Refreshment, Comfort, raising of our depressed Spirits upon any sudden Occasion, as in *Deliquiums*, *Faintings*, *Syncope*s, *Leipothymies*, &c. is by the Senses; especially that most exquisite Sensation at *Stomach*; because Refreshment by Nourishment and Alteration, cannot be perform'd but in a long time, wherein we might in many Cases perish before we could be relieved thereby: Thus a pleasing, and therefore comfortable Odour, excites the Spirits in a moment; the sight of a beloved Mistress, or dear Friend, raises us immediately; when we are most cast down; as does also sweet Melody, and an agreeable or pleasant Sensation at *Stomach*, as of

of Wine, Cordials, hot Spirits, &c. I hope none will say, That Musick, the sight of a Bag of Money, &c. send *Effluvia's* for that end, yet are great Comforters.

II. *The Part, Office, or Business, of the External Medium, in the Oeconomy of Sensation, being to receive and convey Impressions, as Sound (or tremulous Motion) from a Bell to the Ear, &c. it must be duly qualified for that purpose.*

It is true, that we are not concerned as to this *external Medium* (or Air) in our Case, because *Opium* affects only our *Feeling internally*, and immediately at *Stomach*, where it touches the very *Organ*, (or *Membrane* :) However, because this *External Medium* (or Air) is to receive and convey *Impressions* after the same manner, from the *Object* to the *Organ*, as the *Internal Medium* (or *Animal Spirits*) is to receive them from the *Organs*, and convey them to the *sensitive Soul*, and therefore bear exact *Analogy* to each other; and because the *External Medium* (or Air) is more obvious than the *Internal*, (or *Animal Spirits*) I think it very convenient to consider its *Dispositions* and *Requisites*, as a *Medium*, that we may the more clearly perceive those of the *Animal Spirits*, as such.

I. *It is requisite that the Air, as a Medium, (being a fluid Body) should be springy, (or elastick) because nothing but what is so is capable of tremulous Motion, (which is material Sound) nor of Compression, without which, a loose, tenuious, yielding Fluid, as the Air is, cannot be fit to convey Impressions; for the more solid any thing is, the fitter it is for that end; therefore Compression must render it firm, tight, and close, that one Part may briskly communicate its Motion, or Impression, to*

the next to it, and that to the next to it, and so indefinitely ; yet can it never arrive at the Perfection of a *Solid* in carrying of *Impulses* : Hence it is that *Sound* decays by *degrees*. However, it has many great *Advantages* over a *Solid*, as a *Medium* for the purpose of *Sensation* :

First, Because it receives *Impressions* better.

Secondly, Because a *Solid* having *weight*, could not be so easily moved, in order to convey the *Impressions*.

Thirdly, Because there would be no living or being in a *Solid*, as there is in the *Air*.

Fourthly, Because if moved, &c. it would deal very rudely, grate and tear the very *Organs*, and not gently touch them, as the yielding *Air* does ; besides many other *Inconveniencies*, which to mention is to little or no purpose. So being *fluid*, *tenuous*, *yielding*, &c.

2. It is (as was intimated) *requisite*, that it should be compressed, for the better conveyance of *Impressions*, the more the better ; for then (like a *Gut* blown very tightly) a small *Impression* cannot be made upon one part thereof, but it is communicated a good way to other *Parts* : But if not compressed, you may compare it to a *Gut* half full of *Air*, or a loose soft *Lock* of *Wooll*, that yields, and will not convey *Impressions* at all, or very faintly ; whereas if the *Air* be tightly compressed in a *Gut*, &c. you cannot make a little *Impression* (or *Dent* thereby) at one end of it, but the whole contain'd *Air*, having less room by so much, becomes more compressed, and consequently thrusts so much the harder against all the *sides*, and the farther end thereof, especially if the *Gut* has no *vent*, or that it be not too wide ; for, in the first Case, the *Air*, that should be kept in for the communication of the *Impression*,
having

having Liberty at the *Vent*, takes its course that way, and so disappoints the continuation of the *Impulse*, (or *Impression*) either wholly, or in great measure; In the second Case, the *Impulse* bearing but a small *Proportion* to the whole, and also decaying in *Proportion* to the *Liberty* it has to widen, becomes much more insensible, or less remarkable.

Thus if you make a *Dent*, or *Impression*, of the bigness of half a small *Pea*, at one end of a *Gut* so filled with *Air*, that is of the bigness of one's Thigh, and two Yards long, it will bear a very small *Proportion* to the whole, and consequently very insensibly affect it; for 'tis like a *Drop* (as the Saying is) added to an *Ocean*; but if an *Impression* (or *Dent*) of that bigness be made upon a *Gut* no bigger than a *Pea* in diameter, the *Thrust*, or *Impression*, will be very considerable at the other end, for the Reasons aforesaid. So that you plainly see, 1. That the more *Air* is compressed, the better it conveys *Impressions*: Hence it is that we hear *Sounds* better, and farther, when the *Air* is most compressed, and the *Quicksilver* high in the *Barometer*, (or *Weather-glass*) and upon low Grounds, tho' flat, and without any hollownes, than on the tops of high Hills that are flat also; because the *Pressure* of the *Air* is less on high Hills. I mention the *Flatness* in both Cases, lest any should attribute it wholly to the more free *Expansion* of the tremulous *Motion* on the tops of Hills, which indeed is a Reason where the *Flatness* is not alike, as far as the *Sound* goes. 2. That the narrower the *Gut*, *Duct*, or *Pipe*, the *Air* is in, the smarter and more sensible will be the *Impression* at the farther end thereof, which may be confirmed and illustrated by many *Demonstrations*, *Instances*, and *Experiments*.

Hence

Hence it is, That if one speaks at one end of a Pipe, that is but an Inch in *diameter*, you'll hear it much better at the other *end* than in a *close Gallery* of the same length, tho' this will advantage it much more than the open *Air*: That if one speaks ever so slowly at one *end* of a long Piece of Timber, it is manifestly and distinctly heard at the other *end*, through the narrow *Vessels*, and between the Fibres of the *Wood*: That all Sounds are sharper in narrow Pipes, &c. How easie is it then to contrive invisible *Whispering-Places*, which the World so much admire, and some Religions make such great Use of to deceive the People by pretended Divine and Oracular Responses, of which the Reader may hereafter be aware.

It is for like Reasons that Guns, Bells, &c. are better and farther heard along hollow *Valleys*, than upon *Plains*; that Sounds are heard so well the ways that *Rivers* run; for it is a vulgar Error that the *Water* does advantage the Sound upon *Rivers*; if it did, you'd hear farther at *Sea* than upon *Land*; which is so false, that the quite contrary is true, Sounds being much farther heard by *Land* than at *Sea*. It is a common Observation in *Sea-Fights*, that the Sound is heard at a much greater distance upon the *Land* than at *Sea*.

There is indeed another Advantage in *Valleys*, (and therefore upon *Rivers*) viz. the several Reverberations, or *Eccho's*, from the *Hills* and high *Banks*, *Rocks*, &c. on the *sides* thereof; but this not much concerning our Purpose, I must (for the present) pass them and several Observations upon Sounds.

For the afore said, and other ends, it is notorious that the *Air* is springy, and always under the compression of the *Atmosphere*, or else it would be of little use as a Medium.

I know but one thing more to our Purpose that is worth the mentioning, in reference to the *Analogy* between the *Air* and *Animal Spirits*, as *Mediums of Sensation*, viz.

3. It is requisite, or convenient at least, that the *Air* have an homogeneous Continuity, which much more advances it in conveying *Impulses*, (or *Impressions*) than when it is discontinued, divided, or sever'd, by other heterogeneous *Particles*; especially if these be in motion between the Parts of the *Air*; for then they very much disappoint and disgregate the *Impressions* made thereon.

Therefore it is, that we hear so much better after *Sun-set*, or in the *Nights*, especially the *Summer-time*, than in the *Day*, when the *Particles* of *Heat*, and others thereby raised, do too much divide, discontinue, and disgregate the *Impressions*, and the Parts of the *Air*: Where you may observe how Good and Wise *Providence* orders Hearing to be more useful in the Night, when Seeing fails. It is a vulgar *Errour*, (tho' little thought so to be) That the Cause of the Difference of hearing Sounds before and after *Sun-set*, is the *Noise* that is made in the *Day-time*, and the Silence of the *Evenings* and *Nights*; which one single Instance (tho' thousands may be given) will fully demonstrate, viz.

In the Famous and Well-governed *University* and *City* of *Oxford*, there is scarce any *Noise* made at the Times of *Divine Service* on the *Lord's Day*, all People being either silent at Church, or shut up quietly and silently in their respective *Houses* or *Colleges*, (the *Heat* of the Days in *Summer-time*, but mostly the good Order of the Place, causing it:) But after *Sun-set*, most People are out, walking and discoursing, or talking at their *Doors*, *Arbours*, or *Gardens*; and all Children

dren (that noisie Part of Mankind) are now permitted to go out, who act their Parts in *Playing, Running, Calling, Tawling, and Crying out* one to another; insomuch that (all things consider'd) I cannot imagine but there must be in general an hundred times more Noise made then, than in the the time of *Divine Service* in the *Heat* of the *Day*; yet may you, notwithstanding all the *Noise*, hear, in the *Twilight*, any thing twice as far as in the time of *Divine Service* in the *Heat* of the *Day*, (I believe I might have said four or six times as far.) The same may be observ'd in any *Town* or *City* that is kept in good Order at the time of *Divine Service*, or in *Camps*, &c. upon several Occasions.

It is not only consonant to Reason that the *Air* should be so discontinued by the Particles of *Heat, &c.* but obvious to the Sight that it is so; for in a great *Heat*, the Summer-time, and clearest *Day*, you may see the very *Air* in a wavering tremulous Motion, which could not be seen of it self, without the mixture of other *Parts*; for disgregation of *Parts*, (as you see even in pellucid homogeneous Things powder'd) causes Opacity.

III. *The Business, or Office, of the Organs of Sensation, in the Oeconomy thereof, being to receive and communicate the Impressions to the Animal Spirits with all the smartness they can, it is manifest, that in the Membranes, (or Organs) Tension is their main Requisite.* Hence it is that when the *Tympan* of the *Ear* is tense, the *Cornea*, and other *Tunics* of the *Eye* sufficiently so, we hear and see acutely and accurately; to that end God has given us a *Power* to render the *Tympan* more tense when we listen; to contract the *Pupilla* of the *Eye* when we look very intently, &c. And we see, that when the

Cornea

Cornea is relaxed, (as it is always when the *Eye* looks deadish, as in *Sleep*, *Drunkenness*, *fainting Fits*, &c.) yet then we either not see at all, or much worse: So it is when the *Tympan* is relaxed. We also always put the *Tongue* in a *tense* condition, when we would taste a Thing exactly. So when any Part is relax'd by Warmth, &c. we do not feel so well and nicely, as when the Part is cold, or more tense, or rigid; nor in *Sleep*, as when *awake*, because all Parts are relaxed in *Sleep*, and contracted when we are awake, which manifestly appears,

1. Because we perspire less when we are awake, than when asleep, which happens because the Pores are closed by the *Contraction*, or *Constriction*, when we are awake, and opened, or loosened, by *Relaxation* when asleep. In all *Relaxations*, as that which happens by *Pleasure*, *Warmth*, *Leishymies*, *Sleep*, &c. we perspire more; and less in *Contradictions*, by *Cold*, *Fear*, *Grief*, *Pain*, or any grievous *Sensation*, or *Passion*.

2. Because all Parts are firmer when we are awake, and more loose and flaccid when we are asleep; none can doubt but Firmness is from *Tension*, or *Contraction*: But in this matter you may expect farther *Satisfaction* by and by.

Obj. Some may needlessly say, How came *Tension* and *Contraction* to be *Concomitants*, or *Effects* one of the other, seeing we make Things more tense, as a Drum's Head, &c. by *Extension*, not *Contraction*?

Answ. I purposely started this *Objection* to clear the Case. Therefore, 1. Observe, That *Violin-Strings* will grow so tense (as will any thing else of like Nature) by *Contraction* in moist Weather,
that

that tears them to pieces sometimes upon that account, and always puts them upon a greater stress; for when a thing is fixed at both ends, it is the same thing to shorten, or contract, the String, to render it *tense*, as to take something from its length between those two fix'd Points; both the *Contraction* and the *Winding* do only take something of the Length away, that is between those two Points, where the Ends are fastned; which causes a great stress of the shortned String, to reach those two Points that it is fastned to: As, suppose you have a String of 11 Inches long, fastned at both ends at the distance of 10 Inches, it will be very loose; then shorten it one Inch, by winding up so much, or by some means contract the String to 10 Inches, or any way shorten it an *Inch*; then it will just reach the Points, and be *tense*, if fastned at them. So there is *Contraction* necessarily causing *Tension*, which was to be demonstrated.

It will be the same in effect, if a String put round any thing is shortned by Moisture, or otherwise, it must grow more *tense*; and so must 500 Strings, if so shortned, or an entire Membrane that covers or includes the whole. Thus Membranes (as a Gut contracted upon included Air) must, when they contract, grow more *tense* upon the included *Animal Spirits* in the *Nerves*, or otherwise; for it is the same as forcing much Air into a narrow, or contracted Gut, or Bladder, which must make them *tense*, while the elastick Body must thrust out the harder, the more it is compressed. And that the Membranes, and all sensible Parts, are more contracted when we are awake, doth farther most plainly appear: Because,

of Opium Reveal'd. 111

3. The *Cornea* of the *Eyes* (which is a visible and certain sign of the *Relaxation* of all the *sensible Parts* of the *Body*) is relax'd in *Sleep*, as any one may see; for that is the cause of the deadness of the *Eye* in *Sleep*, which upon awaking is immediately gone, by the *Cornea* contracting into a tense condition upon its *Contents*, by which means it becomes tense, rotund, hard, smooth, shining, and reflects a brisk *Speck* of *Light*, (as round Things do) which makes it look lively; whereas when 'tis lax, as in *Sleep*, *Syncopes*, *Faintings*, &c. it is uneven, soft, and reflects an uneven, dull, indefinite *Light*, all which causes the deadness of *Looks*. Therefore (as was intimated) there is no better sign of *Relaxation* than deadish *Looks*.

4. The *Pupilla* (which is another sign of *Relaxation*) is relaxed, or dilated, in *Sleep*, and contracted when we are awake.

5. All *Motions* of the *Body* are better performed when we are awake; which argues the greater contraction of *Parts*; for *Relaxation* (as in *Sleep*, *Deliquiums*, *Drunkennes*, &c.) weakens all *Motion*.

6. That *Efflorescence* of the *Skin* which People have when asleep, (which is caused by the *Relaxation* of the *Skin* admitting the *Bloud* more into it; as *Paleness* is by the *Contraction* of the *Skin* in *Cold*, *Fear*, &c. repelling the *Bloud*) disappears upon awaking, by reason that the *vigilative Contraction* (so I call it) does send the *Bloud* out of the *Skin* by squeezing it back, or repelling it.

7. Measure the *Body* ingeniously and accurately, and you'll find it contracted and narrower, after awaking, than in *Sleep*.

8. Hence it is that you find, when the *Body* is pretty full of *Moisture*, and the *Weather* hot, a sudden *Sweat* upon awaking; because the whole
Body

Body contracting, does, like the contortion of wet Linen, cause an exudation of its *Moisture*, by a *mechanical expression*, or *squeezing*.

9. Hence also it is that we are subject to take *Cold*, even in a warm *Room*, if we watch long; because the *Pores* being closed by that *vigilative Contraction*, hinder *Perpiration* too long, and too much: Therefore it is that all *Colds* are worse towards the *Evenings*, because that *Contraction* closes the *Pores* all day; and not only *Colds*, but many other *Distempers*, especially such as *Perpiration* is good for; as indeed it is for most *Diseases*, as being the most *natural* and *considerable Evacuation*: *Most natural*, because it requires no voluntary *Motion*, or *Irritation* of the *senfile Parts*, as that of *Siege*, *Urine*, &c. which either require the *Will*, or *Irritation* by *Quantity* or *Quality*, or *both*, or *all three*; but *Perpiration* (like *Fumes* in a *Chimney*) requires only that its little *Funnels* (the *Pores*) should be open, because our *Fumes* pass (as the other do) by their own *natural Levity*: And it is *most considerable*, because *universal*, and that much more is evacuated that way, than by all *Means* and *Ways* whatsoever.

Hence it is that all *Membranes* gaining a *Tension*, by the *vigilative Contraction* in manner aforesaid, are more rightly disposed to receive and communicate *smart Impressions* to the *Animal Spirits*, while we are awake, which was the Thing aim'd at, and will be much more illustrated by the *Consideration* of the *Animal Spirits*, and the *Sensitive Soul*.

Note, That the *Membranes*, *Vessels*, and *Roads* of the *Animal Spirits*, being much narrowed and compressed by this *vigilative Contraction*, Two other main *Requisites* for exact *Sensation* do of course

course follow, (so consentaneously do the Works of God conspire to their Ends) viz.

First, That an Impression made upon the Animal Spirits in Pipes so narrowed, is better, more exactly and smartly convey'd to the sensitive Soul, as has been shewn, by the Analogy of the External Medium in slender Pipes.

It is by such narrowing of the Nerves, Pipes, Roads, &c. of the Animal Spirits, that cold Weather, which contracts the Parts, makes our Feeling more nice and smart than warm Weather, which relaxes the Vessels, and gives the springy Animal Spirits (for such they are, as shall, by His Assistance that made them, appear) leave to expand, by which means, and the Vessels widening, the Feeling grows duller, for want of compression of the Spirits.

By what has been said, you may see why Persons of a fine and delicate Texture (that is, of smaller and slenderer Vessels) have a more exquisite Feeling; that little Animals, as Spiders, Flea's, and many such, have most nice and accurate Feeling, because their Nerves, Vessels, Pipes, &c. are proportionably small, and the smaller they are, the more accute is their Feeling, for the Reasons aforesaid; which was absolutely necessary, because they deal with small Things proportionably, as their Food, Treading, &c. and that small Things may harm them, unless they take distinct notice thereof to defend themselves; whereas Elephants, Camels, Horses, &c. can, because of their large Vessels, scarce feel such Impressions, as would crush those little Animals to pieces. Lord, how manifold are Thy Works! In Wisdom Thou hast made them all!

It is from this *Fineness* and delicate *Smallness* of the *Nerves*, *Fibres*, and *Membranes*, &c. that one Part has a more exquisite *Sensation* than another, and that the extream Parts have (generally speaking) better *Feeling*.

Secondly, It follows, that by reason of the *vigilative Contraction* of the sensible Parts, the *Animal Spirits* must gain a considerable *compressure*, whereby (as the *External Medium* is rendred fitter to convey *Impressions* by the help of *Compression*) they are better disposed to convey *Impressions* to the *sensitive Soul*; for the *Internal* and *External Medium* having like Office in the *Oeconomy* of *Sensation*, and (as you'll find) like *Qualifications*, must be affected alike by *Compression*; but whether they are the same thing, or no, I shall not need the *Discussion* of that Point here; therefore I leave it to my Tract of *Animal Mechanism*.

IV. *The Office, or Busin^s of the Animal Spirits (or Internal Medium) being to receive Impressions from the Organs, and convey them to the sensitive Soul, as that of the External Medium (or Air) was to receive them from the Object, and convey them to the Organ; the requisite Dispositions for its purpose, are manifest from the Analogy of the External Medium, viz.*

First, *That they should be springy, (or elastick;)* and that they are so, appears,

1. From their very Office, which being *tenuous* and *fluid*, they could never perform (as the *Air* cannot) without being springy.

2. If they were not *elastick*, and thereby compressible, their *Vessels* could never be so contracted (as has been shewn) without squeezing them quite out

out of them, which is a Disorder not to be supposed in the *Works of God*.

3. If they were not *elastick* (or springy) they would not fill their Vessels upon *Relaxation* thereof, which would leave a *Vacuity*, and thereby cause a *discontinuance of Motion*, or (at least) a great disorder of it, which would cause dismal *Convulsions*, if not *Death* it self; which is most likely.

4. They could not be so active, nor indeed at all active, without *springiness*; for they cannot act up and down, and all manner of ways, (as they do) by either *Levity* or *Gravity*, or by any other known or imaginable *Qualification*, but *Elasticity* (or *Springiness*.)

5. It cannot be conceived why they should be more active one time than another without *Elasticity*; but they are more active at one time than another, as appears by several *Places* or *Passages* of the Premises, and in the *waking* more than in such as are *asleep*.

6. It is manifest, that they are *elastick*, by their springing into a Limb held up or down; and, that with such Force as to cause a great *Pain*, after they have been excluded from it by some *Accident*, as leaning, or pressing too hard upon a Nerve, &c. for neither *Levity* nor *Gravity* can do so, especially both up and down (as was said;) nor is there any *Propulsory Engine* for them, as is for the *Blood*, therefore it must be from their *springiness*.

7. They could not cause brisk and smart *tremulous motions* in the *Body*, if they were not *elastick*, for such cannot be conceived by any means without it; but there are several brisk and smart *tremulous motions*, caused by the *Animal Spirits*, as in the *Shiverings* of *Ague Fits*, *Frights*, *Cold*, *Surprizes*, *sudden* or *exquisite Pain*, *Tremors* of the *Hands*, *Head*, &c. in *Old Age*, in some *Convulsions*,

ons, &c. Therefore the *Animal Spirits* that cause them are *elastick*.

8. Muscles have no springiness of themselves, when the *Animal Spirits* are excluded from them, as in *Palsies*, &c. but all *Muscles* in their *Exertion* are very springy, insomuch that if you hold any of them back, or restrain them from their motion, and again suddenly leave them at liberty during the *Exertion*, they, or any Part moved by them, will spring out very violently, as in *Flipping*, an *Arm held back*, &c.

But nothing proves this Matter better than the *Tongue*, in forming the *Sound* of the Letter *R*, for in that Case the *Tongue*, after it is put in *Tension* and *Exertion*, being suddenly hit against the *Inside*, or *Gums* of the *Upper Teeth*, does thereupon (as *Springy Bodies* used to do) fall into a *tremulous motion*, or *jarring*, that causes the *snarling sound* of *R*, which nothing but springy Matter can do.

9. Were they not *springy*, they could never convey the *tremulous motion* of *sound* to the *sensitive Soul*, and indeed over all the *Systeme* of the *Nerves*, by which is caused (as may be proved) that *Motion* of *Consent* call'd *Dancing*, and the *Fingers*, &c. to move and keep *Time* with the *Musick*, even when it, or the *Finger*, are not as much as thought of, because the *Animal Spirits* have the same *Capacity* with the *Air*, to receive and convey it, by Reason of their *springiness*, and greater by Reason of their more forcible *Compression* by the *Vigilative Contraction*, super added to the *Compression* of the *Air*, under which they are, as well as the *Air* it self, as plain Reason tells us; for that which *Compresses* the whole *Body*, must needs *Compress* the *Animal Spirits*: The

Expe-

Experiments of the *Air-Pump* do confirm the same.

10. There can be no doubt but the *Animal Spirits* are nourish'd, or sustain'd by the *Air*, if they be not *Air*; therefore they are *elastick*. What needs any more *Arguments*, when several of the former are *Demonstrative*? And, that,

11. All *Physicians* and *Phylosophers* (that I know of) do allow, that the *Animal Spirits* are *elastick*.

Secondly, *It is requisite*, (as was said of the *External Medium*) that they should be compressed, to render them fit to convey *Impressions*; and that they are compressed is evident (as was before intimated.)

1. By the *Atmosphere*. 2. By the *Vigilative Contraction*; which makes them much more disposed to convey *Impressions* than the *External Medium*; besides, that very often Two other *Contradictions* (that are shewn in the remaining Part of this Chapter) are added thereto; and, that the *Animal Spirits* are wholly contained in *Pipes*, (to prevent their *Expansion*) and that of the narrowest sizes that can well be imagined; but the *Air*, or *External Medium*, is at large in the *Atmosphere*; so that all the *Impressions* made upon the *Animal Spirits* are very tightly, closely, and smartly convey'd, nor have they but a little Way to pass, that is, the length of the *Animal* at most, which also may be some Advantage to small *Creatures*. But in *Sleep* the *Vigilative Contraction* being lost, and the *Animal Spirits* thereupon expanded, all *Impulses* must needs be carried very faintly, both because the *Organs* (or *Membranes*) are indisposed by *Relaxation*, and the *Animal Spirits* by *Expansion* upon that *Relaxation*, for want of due *Compression* to fit them.

Thus have you (after many vain Enquiries) the true Mechanical Cause of the Difference of Sensation, Sleeping, and Waking, and the plain Reason, why our Motions are so feeble in Sleep, viz. Because the Animal Spirits have lost much of their Force, Springiness, &c. for want of due Compression, by Reason of the Relaxation of all the Vessels that include the Spirits.

Thirdly, It is (in some Measure) requisite, that the Animal Spirits should have an Homogeneous Continuity, as was shewn by the Analogy of the External Medium, which does not convey Impressions as well in the Heat of the Day, as in the Night, or after Sunset; because its Parts are more discontinued and disgregated by the Particles of Heat, Fumes, &c. in the Day Time; nay, if Things be discontinued, they never carry Impressions so well, tho' placed contiguously afterward; Thus a long Tree that conveys sounds so exactly from one end to the other, while all is continued, and in one Piece, will not convey the sound so well if it be cut into many Pieces, tho' they are afterward put close one to the other.

As to this Matter of Continuity in the Animal Spirits, seeing it does not much concern us, and that People in a State of Health are supposed to have it, and that it is not our Business here to enter upon the Consideration of Nervous Distempers, I need not use any more Words about it; but that if it any Way happens to be discontinued, as either by the Penury thereof, that they do not quite fill all Parts of their Vessels, or any Matter intercepting their Parts, or that the Vessels should be so relaxed, or widen'd, that the Animal Spirits cannot so well fill them up, &c. such Causes must destroy

destroy or lessen Sensation, tho' the bare mixing of *Fumes* with them would not (considering the shortness of the *Way* that Impressions are carried in *Animals*) much alter the Case, as you find *Fumes* in the *Air* do not much hinder sound at the distance of a *Yard* or *Two*, wherein it is insensible (to common Observers at least;) so that if some *Fumes* from a Grain or Two of *Opium*, did mingle with the *Animal Spirits*, it would not cause a sensible difference of *Feeling* in the short space of the length of an *Animal*: But I have proved, That no such *Fume* from the *Opium* mixes with them, therefore need say no more of this *Matter*.

V. *The Office or Business of the sensitive Soul in the Oeconomy of Sensation, being to perceive the Impressions conveyed to him by the Animal Spirits, that he may, if he finds them disagreeable, bestir himself in Defence of the Animal.*

First, *It is requisite he should attend to all Impressions offer'd him by the Animal Spirits, otherwise Impressions of great Concernment may escape his notice, and consequently want his Assistance by Way of Defence. For*

It is manifest, That when his *Attention* is diverted by any *Object*, more especially by such as mightily pleases him, as in the *Act of Vener*y, and other *Pleasures*, especially if *intense*, that he does not perceive other *Objects* at the *Time* that he is so diverted; and if the *pleasant Diversion* be *intense*, and *permanent*, as in the Case of *Opium* and *Wine* drank in a considerable Quantity, he is so taken up, diverted, or charm'd therewith, that he does not attend to the *Business of Sensation*. This is one Reason why such as are far gone in

Drink, have none of their *Senses* aright ; but as to the *Illustration* of this *Matter* you may expect more hereafter.

Note, That the *sensitive Soul* is the only Thing in an *Animal* that has *Perception*, and therefore the only Thing that is sensible of any *Grievance*, *Weariness*, *Hunger*, *Pleasure*, *Comfort*, &c.

Secondly, It is requisite, that it should use all Means that is in its Power, that the Impressions should be brought to it very entirely, exactly, smartly, &c. so as to have due notice of all Objects, and the smallest Impressions that may be.

For which good Ends and Purposes God has endued the *sensitive Soul* (as will be fully proved) with a Power of contracting all the sensible, small, and slender Pipes, Vessels, or Passages of the *Animal Spirits*, for the more express, distinct, and accurate Conveyance of all Impressions by the Help of Compression ; Therefore the *sensitive Soul* taking the Advantage thereof, for better Information, in order to Self-Preservation, does (by the Appointment of the Preserver of all Things) execute his Power by the aforementioned *Vigilative Contraction* of those Parts, to cause their Tension and greater Compression of the *Animal Spirits*, to improve the Impressions that are to be convey'd to him, and render them more observable ; This God, who has made nothing to be idle, and particularly ordered the *sensitive Soul* in *Adam* for Labour, especially in Reference to their own Safety and Preservation, has made to be the ordinary Employ or Day-Work of the *sensitive Soul*, that by the said *Vigilative Contraction*, the Organs, Membranes, Vessels, &c. may be render'd more tense and firm, and the *Animal Spirits* more compressed,
springy,

springy, prompt, flippant, and forcible, for the Benefit of Sense and Motion, upon all Occasions of Defence, Flights, Struggles, &c. which is our State of Vigilancy (as has been intimated.)

But the keeping of the said Parts, Membranes, &c. in continual Contraction, even against the Remittency of the elastick Spirits, (which resist, and thrust the harder against their Vessels, by how much the more they Compress them by the *Vigilative Contraction*) being a continual tedious Labour and Fatigue, of which the sensitive Soul being sensible, (as the only Perceiver of Lassitude, or indeed of any Thing besides, in an Animal) and in his Nature but material, changeable, fatigable, frail, subject to be worn out, and capable of Decay, (which makes the Certainty of Death in all Animals, and in us since the Fall into an Animal Nature) does, upon that Account, and lest the continual Contraction and tensive Stress of Parts, by that Means, should spoil their Tone, and to recruit the wasted Spirits by Rest, (after tugging all Day at the *Vigilative Contraction*) grow willing to give over the Drudgery, however convenient for the Uses aforesaid; Therefore being allow'd convenient Rest by his Maker, he, for the great Benefit of Refection, without which he cannot continue his Being, and for the sweetness of Ease, loosens the Reins of *Vigilative Contraction*; whereupon Sensation and Promptitude to Motion (which were maintain'd by that Contraction, causing the Tension of Organs, and Compression of the Animal Spirits, as has been Mechanically demonstrated) fail by the Relaxation of those Organs, Membranes, and Vessels of the Spirits, and the consequent Expansion of the Animal Spirits; so that now only the Compression of the Atmosphere remains, which (as you see in a Gut half full of Air under that Pressure) is not sufficient to convey the

Im-

Impressions with any *Smartness*, or cause the *Animal Spirits* to spring vigorously into *Motion*; which *Decay* or *Failure of Sense* and *Motion* by *Relaxation*, and the consequent *Expansion* of the *Animal Spirits*, is the State of *Natural Sleep*.

Note, That *Relaxation* is a necessary *Consequence* of the *Privation* of *Contraction*, and requires no *Labour*, but a bare *Remission* of that *Contraction*.

Note, That the *Watching Part* of our *Lives* is upheld by *Force*, and that *Nullum violentum est diuturnum*, and consequently a necessity of *Sleep*, and at last of *Death* it self.

Thus have you the true *Reason* of *Sleeping* and *Watching*, which will naturally, plainly, and easily solve all the *Phænomena's* thereof; for it is most evident from the *Premises*:

1. Why *Watching* and *Sleeping* observe a *Proportion* between them; the being tired with one being the cause of the other.

2. Why *Sense* and *Motion* do fail so much in *Sleep*, viz. by the *Relaxation* of all *Parts*, and *Expansion* of the *Animal Spirits*.

3. Why they always fail together, and in like *Proportion*.

4. Why they do not wholly fail in *Sleep*; because the *Compressure* of the *Atmosphere*, &c. remains.

5. Why in *Sleep* the *Limbs* are (like a *Gut* half full of *Air*) *lax*, *limber*, *flaccid*, and yielding all manner of *Ways*; because all the innumerable small *Vessels* that contain the *Elastick Animal Spirits*, are (as that half fill'd *Gut* I mentioned) not tightly fill'd, which if they were, would be *firm* and
tense,

tense, as such a Gut, blown up very full and forcibly, is; which *Vessels* being all over the *Body*, confirm the whole *Tone* when we are awake, and the *Vigilative Contraction* compresses the *Animal Spirits* into a Steadiness, and (as it were) a kind of *Solidity*.

6. Why (as appears by *Statick Demonstrations*, and *Experiments*) we perspire more when asleep than awake; because the *Pores* are closed by the *Vigilative Contraction*, and open'd in *Sleep* by the contrary *Relaxation*, which therefore always causes free *Perspiration* where ever it happens, as in *fainting Fits*, *Syncopes*, *Leipothymies*, and by *Warmth*, especially if moist and emollient, as in *Baths*, *Fomentations*, *Feet Washes*, *Head Washes*, &c. as also when *Pleasure* relaxes, as in the *Act of Venery*, great *Joy*, after good *Meals*, or some *Glasses of Wine*, &c. all which cause plentiful *Perspiration*, because they relax, and thereby open the *Pores*, (as more fully appears in the following *Discourse*) by Reason of the *Pleasure* that they cause, which diverts the sensitive Soul from his *Employ of Contraction*.

7. Why, the *Pores* being open by the *Relaxation*, we sweat in our *Sleep*, if we are fill'd with Matter for it, viz. Ἰδρώς πολὺς ἐξ ὕπνου ἀνευ φανεραῖς αἰτίας γινόμενος, τὸ σῶμα σημαίνει ὅτι πλείον τέρεον. That is, *Much Sweat in Sleep* argues, that much *Food* (or *Nutriments*) was taken; of which *Drink* is the greatest Part in Bulk, even in *Sober Persons*. I mention this to shew the Difference in the Case of *Perspiration* and *Sweating*, for that always happens in *Sleep*, but not *Sweat*, unless the *Body* be well fill'd with *Moisture*; To shew the Cause of which *Difference*, will be the Business of my Tract of *Animal Mechanism*, if I have not hereafter an *Occasion* to do it in this Tract, as (I suppose) I may.

8. Why

8. *Why* Sleep cures Colds (by opening the Pores.)

9. *Why* the Skin is more florid in Sleep; because (as has been said) it being relax'd admits the *Bloud* into it, which *Vigilative Contraction* does in good measure repel, and thereby cause the Skin to appear more *white* and *pale*, as it is, and any one may observe upon awaking.

10. *Why* the Eyes look deadish in Sleep, viz. because (as has been shewn) the Humors do not fill up the relaxed *Cornea* to a due *Tension* and *Roundity*, which (as was said) makes the *Cornea* shine, sparkle, and particularly to reflect a brisk *Speck* of Light, (as shining round Things must do) which *Speck* if Painters omit, the *Eye* looks deadish, therefore they should, when they have a mind to express the *Deadness* of the *Eyes*, as in *Fainting Fits*, *Syncopes*, *Sleep*, *Death*, *Wanton loose Oglings* of *Lovers*, *Drunkennes*, &c. omit that *Speck*, or rather draw it duller, wider, and discomposed in Figure, with the *Pupil* very large, and the *Upper Eyelid* falling down loosely, which would exactly express the *Deadness* of the *Eye* in all those Cases of *Relaxation*, in which alone it so appears. Note, That the Reason why some in such Cases see *divers Colours* before their *Eyes*, is, because the uneven *Cornea* variously retracts and reflects the Light, which I mention because none (that I know of) have observed the Cause.

11. *Why* People are more sleepy in warm moist Weather, viz. because the Parts are more relaxed, and the Pressure of the *Atmosphere* less to assist the *Vigilative Contraction*, to keep us in a waking State by the *Compressure* of the *Animal Spirits*: How much better therefore is a cool and dry Air, that raises the *Mercury* high in the *Barometer*, (or *Weather Glass*) both for *Heath* and *Action*? because it renders the *Animal Spirits* more powerful,

ful, prompt, and *slippant* by the *Compression*. This should be observ'd by such as are to run *Races* alone, lift *Weights*, or perform any Thing that requires *Strength*, *Vigour*, or *Speed*; nor can I doubt, but if we had an Artificial Means to compress Men's *Bodies* in a high manner, (as by putting them into convenient Cavities, and forcing Air upon them) but they would be much stronger for the Time, and thereby enabled to do *Exploits* beyond their ordinary Strength; which puts me in mind of several Things that confirm it very much, as Mens lifting of greater *Weights* in low Places, than on the top of very high *Hills*, where the Pressure of the *Air* is less to compress the *Animal Spirits*; The *Contraction* of all Parts in lifting of great *Weights*; The prodigious *Leaps*, and *Swiftness* of some Persons in great *Frights*, *Terrors*, &c. which mightily contract the *sensible Parts*, and *Vessels* of the *Animal Spirits*, by which Means they are render'd more *springy* and *powerful*.

Note, That the true Cause of Strength is the Compression of the *Animal Spirits*, and that (probably) the Force of Muscles may some way or other depend upon't, which is not my Business to explain at present.

Note, That it is the *Membranes* are primarily contracted, and the Medullary Part of the *Nerves*, *Spirits*, &c. compressed thereby by Consequence.

12. Why the soft fleshed, and moist, are more sleepy, as Children, &c. viz. because the Compression of their *Animal Spirits* is not so great by Reason of the laxity of their Parts, so are they weaker for the same Reason, which tells you why little Men,

Men, whose Flesh is firmer, that are no bigger than Boys, are much stronger than Boys or Women of the same bigness.

13. Why warm and emollient Baths, Fomentations, Feet or Head Washes, &c. do (as moist and warm Weather) cause Sleepiness; and indeed all Things that cause Relaxation, or incline the sensitive Soul to leave off contracting, as Weariness, &c. do cause Sleep.

Note, That in dry Bodies, as old People, &c. such Emollient Baths, Fomentations, &c. with the Use of Emollient Moistners inwardly, will cause Sleep very finely, when Opium it self will not; and that Opium in such Cases should be used with such Things both internally and externally; but (which is not observ'd) the Baths, Fomentations, &c. should not be above the Warmth of Blood, because the Heat may otherwise cause too much motion of the Blood and Spirits, which is a great Enemy to Sleep, that consists in their Rest, and the aforesaid Relaxation of Parts, by both which co-operating, you may, and cannot fail to cause any Man to Sleep, if you can make them concur.

14. The same Relaxation causes the Pulse to be larger and slower in Sleep, Nocturnal Pollutions, want of due Contraction and Sensation at Stomach, by which Means the Meat stays longer there in our Sleep, than when we are awake; So,

15. Frets, Commotions, and Perturbations of the Spirits, &c. are compos'd by Sleep, because the sensitive Soul (who is the Original of all motion) is at Rest, and that the Animal Spirits being expanded, are nearer their absolute Rest, which consists in a full and perfect Expansion, so that there is no farther Endeavour towards Motion.

16. Sen-

16. Sensation being much lessened by the *Expansion* of the *Animal Spirits* upon the said *Relaxation*, the Sense of the *Irritation of Humours* is thereby lessened, or quite taken away, whereupon all *Fluxes* occasioned by the *Irritation of Humours*, as *Diarrhea's*, *Dysenteries*, *Catarrhs*, &c. are stopt or moderated (at least) by *Sleep*; Besides, that *Relaxation* being quite contrary to *Contraction*, by which those *Humours* are squeezed out, lets the *Humours* stay quietly where they are, *Relaxation* being more for receiving, containing, detaining, and suspending *Humours* in the *Parts*, than sending them forward, as you see in a *Sponge* first contracted, and afterward suffered to dilate, or expand it self in a *Dish* that has some *Water* in it, which it takes into it self, and suspends till something squeezes it out by contracting it.

17. Therefore it is that the *Spittle* does not come into the *Mouth* in *Sleep*, or very little, and that *People* are apt to awake thirsty, tho' it is soon taken off in some measure by the *Vigilative Contraction* squeezing out the *Spittle* into the *Mouth*, unless there is some special Cause to the contrary.

18. For the same Reason the *Menstruum* of the *Stomach* comes but very slowly into the *Stomach* in *Sleep*, which is one Cause that *Digestion* goes on but slowly in *Sleep*.

Note, That *Digestion*, and sending the *Chyle* out of the *Stomach*, depending both upon *Contraction*, they are hastned and retarded in exact *Proportion*, so that the *Extrusion* keeps equal *Pace* with the *Digestion*. How equal and duely proportioned are the Works of Nature!

19. It is plain also from what has been Stated concerning *Sleep*, why *Ague Fits* seldom (if ever)

ever) take *People* in the time of their first sound *Sleep*, because the *Shivering* is caused by a grievous *Sensation* of the *sensile Parts*, which cannot well happen in that sound *Sleep*, wherein there is so little *Feeling* by Reason of the said *Relaxation*; and because *Relaxation* opposes *Contraction*, by which that *Shivering* is promoted. Such a *Relaxation*, and Failure of *Feeling* thereupon, is the true Cause why *Opium* puts off *Ague Fits*, &c. So,

20. The *Relaxation* in *Sleep* stops *Vomiting*, by taking away the *sense* of the irritating Cause, and quieting (as I have intimated) all *Motions* in general; so *Sleep* stops *Hiccoughs*, *Hemorrhages*, *Diary Fevers*, &c.

21. Why *Watching*, *Labour*, or what impairs the *Spirits*, and tires the *sensitive Soul*, inclines us to *Sleep*, that is, disposes the *sensitive Soul* (the only *Feeler* of *Lassitude*) to give over *Contracting* the *Sensile Parts*, which (as will plainly appear by and by) spends the *Spirits*, as *Sleep* by relaxing them causes a *Recruit* thereof.

To be short, (tho' one can hardly be too long in solving *Phenomena's*, which is the *Proof* of the *Truth* of a Man's *Affertion*) the *Mechanical Demonstration* that I have made of the State of *Sleeping* and *Waking*, does so evidently explicate all the *Phenomena's* of both, that I am even ashamed to run any farther upon such plain Matters, (so obvious are Things when the *Truth* is known,) and therefore (having mention'd those *Circumstances* and *Effects* of *Sleep*, that mainly concern us) I must give over, lest the *World* should think, that I take all my *Readers* to be *Idiots*, by using too many Words in so obvious a Thing; or, that I am no better for using them without Cause; for the *Truth* of this Matter seems to me to out-shine

shine all the *Arguments* I can make for it, such Splendour does *Truth* shew upon the first *Glimps* thereof, as I take the Account I gave of *Sleep* and *Watching* to be; for the *Opinions* I have met concerning them were quite *contrary* to, or very *remote* from what I have stated.

1. They went quite *contrary* to it that said, That the *Animal Spirits* were expanded, and the *Pores* of the *Brain*, &c. more open (and consequently more lax) in *Watching*, as *Willis*, and several others; who therefore say that *Coffee*, *Volatile Salts*, &c. are *Antihypnoticks*, (or good against too much *Sleepiness*) because they cause an *Expansion* of the *Spirits*, and open the *Pores* of the *Brain*, supposing (forsooth) that they marched up and down, and so kept the greater stir upon the false *Imagination* of their *Roads* being more open, which (as was proved) are really more close. *Coffee* keeps us from *Sleep* by drying, binding, and both Ways constringing the *Vessels*, as also by a wide grating Quality, which therefore does irritate them to contract, besides that the *Saline Particles* causing an *Agitation*, may contribute thereto, so that by *constringing* and *agitating*, it directly opposes *Sleep*, which proceeds from *Relaxation* and *Quietness*.

2. They were very *remote* from the Mark, that said (as *Wedelius* asserts all do) that *Vapours* were the cause of *Natural Sleep*, which bear no manner of *Proportion* thereto (as was shewn;) As they were also who madly talk'd, That the *Animal Spirits*, which have neither *Life*, *Sense*, *Motion*, or *Election*, did of themselves retire very knowingly to the *Brain* in *Sleep*, and left the *Limbs*, &c. destitute of them, whereas (as has been *Mechanically* proved) they have more *Room* than that at other times in the *Limbs*, and all the *sensible Parts*.

But I will not argue against such senseless and precarious *Absurdities*; it is not worth the while, especially since the *Truth* is manifestly discovered: It would not have been so silly to have affirm'd the quite contrary, viz. That the *Animal Spirits* are forced into the soft and yielding Brain, in Watching, by the *Vigilative Contraction* of all the *sen-
sible Parts* repelling them, as when Cold repels them by a strong *Contraction* of the Parts, and causes a *Stupor* or *Sleep* thereof (as they call it.) But what have we to do with such insufferable *Trash*? Therefore bidding it adieu, let us pursue our *Bu-
siness*.

That it is the *Sensitive Soul*, and nothing but it, has that *Contracting Power*, is evident;

1. Because it is the Original of all *Motion* in the *Animal* as such; and that nothing besides it has any *Life*, *Perception*, *Motion*, or *Power*, and therefore must rest till they are moved.

2. Because, That when the *Sensitive Soul* is diverted by *intense Pleasure*, from attending his *Bu-
siness*, immediately *Relaxation* follows; as in the *Pleasure* of the *Act of Venery*, by *Wine*, *Joy*, &c. in which you have all the *Effects* of *Relaxation*, as *Deadness* of the *Eyes*, *Dilatation* of the *Pupilla*, plentiful *Perspiration*, *Floridity* of the *Skin*, a large *Pulse*, and sometimes a considerable *Failure* of *Sense* and *Motion*, as in the most pleasant time of the *Venereal Act*, *Deliquiums*, *Drunkenness*, *Syncopes*, or *Ecstasies* upon *intense Pleasure*, (which are very properly called *Ecstasies*) *Leipothymies*, *Leipopsychies*, &c. which signifie the *Soul's leaving us* without his *Help* by *Contractions*, which he then does not exercise, as being charm'd, and wholly taken up with *Pleasure*. This is the true Cause of all *Deliquiums*, &c. upon *Pleasure*, *Joy*, &c. all which cause great *Relaxations*, and thereby *Loss* of *Sense* and *Motion*, as being its necessary *Consequences*.

3. Be-

of Opium Reveald. 131

3. Because *grievous Sensation*, which belongs only to the *Sensitive Soul*, puts us immediately out of *Sleep* into a *Vigilative Contraction*.

4. Because the *Sensitive Soul* can, when we are Sleepy, oppose it, by continuing the *Vigilative Contraction*; which proves *Vigilative Contraction* to be in his *Power*.

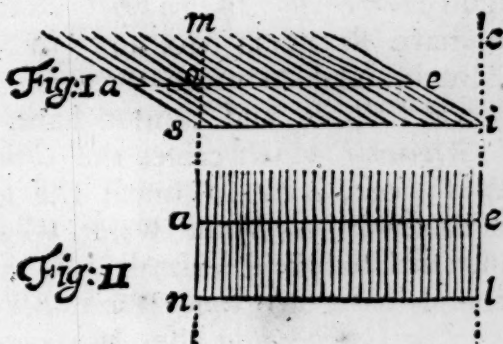
Note, That there is also other sorts of *Leipothymies*, *Deliquiums*, &c. upon the *Sensitive Soul's* being over-tired, (whereof *Natural Sleep* is but a common and ordinary *Degree*, that happens of Course for our Relief) or over-born with some *Fatigue*, &c. as when somewhat grieves at *Stomach*, and that it has laid about it all manner of *Ways*, by *Vomiting*, *Convulsive Motions*, &c. to be rid of it, till it can work no longer; whereupon it lays down the *Cudgels*, desists from all further *Endeavour* by *Contractions*, yielding it self to *Ease*, seeing all *Striving* is to no *Effect*: So, that tho' this *Deliquium*, and the former, differ in their first *Causes*, yet do they agree in the last and immediate, *viz.* the *Sensitive Soul's* not attending his *Business* of *Contraction*, whereupon follows a *mighty Relaxation*, as appears by the *Deadness* (or *Relaxation*) of the *Cornea*, *Dilatation* of the *Pupil*, a great *Laxity* of all *Parts*, a large *Pulse*, or none, very plentiful *Perspiration*, *Stops* of *Hemorrhages*, and all *Fluxes* that require *Contraction*, &c. which happen both upon the *Account* of the great *Relaxation* it self, (as has been shewn) and the almost absolute *Rest* of all *Things* by the *Sensitive Soul's* withdrawing himself from *Business*, more than in *Sleep* it self. I therefore observing the *Degrees* of *Sleep*, &c. do *Note*, That (*God* and *Nature* using a due *Proportion* in all *Things*) the *Sensitive Soul* uses several *Degrees* of *Relaxation*, according as he is tired, and *Refectio*n is wanted: Hence it is, that

such as are much tired *sleep* more profoundly, that our *first Sleeps* are the soundest, and that *Sleep* gradually declines in degrees (as we are recruited) till we awake; the nearer which we are, the more we *dream*, the state of *Dreaming* being a kind of *Twilight* between sound *Sleep* and *Awaking*, or between a full *somniferous Relaxation* and *vigilative Contraction*. And as the *Sensitive Soul* uses all degrees of *Contraction* below that of the *Vigilative*, till it comes to bare *Compression* of the *Air*; so it can exercise *super-vigilative Contraction*, (if I may so call it) that is, much higher degrees thereof than what was requisite ordinarily for a state of *Vigilancy*, as in Cases of *Danger* to the *Animal*, *Frights*, *Terrours*, *grievous Passions* and *Sensations*; by which means the *animal Spirits* being more compressed than under the ordinary *vigilative Contraction*, *Sensation* grows more *nice* and *smart*, and *Motion* more *prompt* and *vigorous* (they always going together) for the *Defence* of the *Animal*, by extraordinary *Flight*, *Repulsion*, or otherwise. Hence it is, upon *Fear*, *Terrour*, *grievous Passion*, or *Sensation*, (which manifestly proves the Being of such an extraordinary *Contraction* upon such Occasions) That,

1. *Perspiration* fails in a yet higher degree than under bare or ordinary *vigilative Contraction*, as appears by infallible *statick Experiments* and *Demonstrations*.

2. It is by reason of the said *defensive Contraction*, (for so I call it, because it is excited in an extraordinary manner for the *defence* of the *Animal* in time of need, or great *Exigence*) That in *Frights*, *Terrours*, &c. our *Hair*, *Dogs*, &c. does stand on end, or more upright; 1. Because the *Pores* do, by that violent *Contraction*, strictly close about the *Root* of the *Hair*, that it cannot swag, incline,
or

or yie'd any way, by reason of its *Weight*, &c. as when the Skin is more *lax* and *soft*, and the Pores, wherein the *Hair* is fixed, more open. 2. Because (which is the *main Reason*) the said *Contraction* renders the oblique *Pores* more upright; as suppose the *Pores* and *Hair* do naturally stand obliquely, (as they do to carry off *Wet*, &c.) as in *Fig. 1.*



And that (a) in *Fig. 1.* is, by the said *Contraction*, brought nearer to (i), as much as is from (a) to (o), then will the *Pores* and *Hair* stand upright, as in *Fig. 2.* and the Skin a, o, e, i, s, contracted and brought within the prick'd *Perpendiculars*, whereas in *Fig. 1.* it excur'd beyond the *Perpendicular* n, m, as much as is from a to o.

3. For the same Reason it is, That the Face, in *grievous Passions* and *Sensations*, as acute Pain, &c. is contorted and wrung awry, as you see in Persons that cry because of *Grievances*, (after the same manner as when they strive to lift up a great *Weight*) and that at the same time Tears, and Moisture at *Nose* and *Mouth*, are squeezed out by the same *Contraction*; which makes People use the Saying of *Casting Snot about* when Men cry. It is for the same Reason that People's Mouths water

extreamly when they are trimm'd with a bad *Razor* that puts them to *Pain*, which contracts the Parts, and squeezes out the *Spittle*.

4. The *Pulse* grows sensibly narrower and harder by the same *Contraction*.

5. It is by the *Contraction* upon grievous *Sensation*, that our Mouths water very much upon a *Nausea* at *Stomach*, because of the continuity of the Membranes of the Mouth and *Stomach*.

6. The same *Contraction* is the true Reason why People, upon *Hunger* (which is a grievous *Sensation* at *Stomach*) have so much *Moisture* (or *Spittle*) in their Mouths, and so much the more when they see good *Victuals*, and cannot have it, because the *Grievance* which causes the *Contraction* that squeezes it out, is by so much the greater. This is the cause why the Mouth waters when hungry People see or smell good *Victuals*. By the same *Contraction* *Moisture* is squeezed out into the *Oesophagus*, (or *Gullet*) and the *Menstruum* into the *Stomach* at the same time; where (observe *God's Good and Wise Providence*) that *Hunger* which calls for *Meat*, at the same time provides *Spittle* to lubricate it for swallowing, and to help *Digestion*, render the *Gullet* slippery and distensible, and causes the *Menstruum* to flow more abundantly into the *Stomach*; and all this when most needed, and that exactly in proportion to the *Hunger* (or grievous *Sensation*) that causes the *Contraction*.

It is well worth your noting, That *God's Wisdom* does always cause the *Want* of what is necessary in *sensible Creatures*, to be the soliciting and urging Cause for supply, that a due *Proportion* may be observed between the Supply and the *Want*; which may upon the telling of it appear so plain a Case, that it is scarce worth the mentioning; but (believe me) it is so little observ'd, (as plain

as it may seem to be) that People have, and do err extravagantly for want of noting it; which if they had noted, they could never have said that *Vapours*, or the retiring of Spirits into the Brain, &c. was the Cause, or Call of natural Sleep; nor feigned *Menstruums* to be the cause of Hunger; but would have duly considered what is mainly supplied by Eating, or recruited by Sleeping, &c. and then had nothing to do but to conclude the Defect of that to have been the Cause that solicited for the Supply in proportion to the Defect: Which, if observed, will most naturally and easily lead you to the true Knowledge of the Causes of all Appetites in an Animal, upon a few Minutes Consideration; for want of which most plain and (one would think) very obvious Method, the deviating World has sadly puzzled it self about the Cause of Hunger, Thirst, Sleep, and the like, to this day, and still is in Disputes about them; of which (tho' my advertent Reader may well prevent me, by using that natural Method) I shall (God willing) give an account in my Tract of *Animal Mechanism*: Only note here, That I do not mean bare privative Defect, as such, to be the positive Cause; but that the Defect of what keeps or guards the Stomach, &c. from the Grievance, causes other Matter to grieve it, cause Hunger, &c. without which means, no Proportion can be observed between Hunger and what takes it away, or our Food.

7. The same defensive Contraction does, upon grievous Sensation, as Pain, Cold, Terrour, &c. cause a Corrugation of the *Scrotum*, contract the Skin into little Tubercles like that of a Goose-Skin, &c.

8. By it, upon grievous Sensation, as by squeezing the Nose very hard, pulling the Hair, Sand, or any such thing, in the Eye, or a Grievance by the Volatile Particles of Onions, Mustard, Horse-Radish-

Roots, &c. the Parts and *Membranes* about the *Eyes* contracting, squeeze out *Tears*, that what grieves the *Eyes* may thereby be washed away, or qualified, as much as the *Tears* can do it.

9. By this *Contraction* repelling the *Bloud*, the *Skin* grows *Pale* by *Cold*, *Fear*, *Pain*, &c. which also closing the *Pores*, stop *Sweat*, as in a moment. You'll have an account hereafter how *Contraction* may cause *Sweat* by squeezing in some Cases, and stop it by shutting the *Pores* in other Cases.

10. It is by it that *Contraction*, that *Fear*, *Cold*, &c. closing the *Pores*, and repelling the *Bloud*, stanch *Bleeding*: So happens also a greater *Contraction* of the *Pupil* of the *Eye* by the same Cause.

11. It is the *Violence* of this *Contraction* upon *Fear*, *Terrour*, *Pain*, *Cold*, &c. closing the small *Vessels* of the *Animal Spirits*, and thereby repelling them, causes the *Shivering* in those Cases, by the *Renitency* of the *elastic Animal Spirits* springing back again, *toties quoties*, having gain'd more *elastic Force* by the very *Compression* it self, which that *Contraction* causes; so that by reason of the dubious *velitation* (or *skirmishing*) between the repelling *Contraction* and the springing *Spirits*, happens a *tremulous Motion*, (as of quivering Springs;) which *Shivering* in *Ague-Fits* did formerly lead me to the *Situation* of the Cause of *Agues* (when I writ my Book *De Febris intermittenibus*) in the *Angustiae* at the end of the *Vessels*, which terminate in the *Membranes*; the grievous *Sensation* of which, causes all the *Shivering* that happens in any Case to *Animals*.

12. By the same *Contraction*, when very violent, and of the whole Body, cold *Sweats* happen in *Pain*, *Fear*, *Terrour*, &c. while it violently squeezes out the outmost, and therefore coldest *Moisture* of

of our Bodies, as *Laundresses* do Water out of wet Linnen by *Contortion*. Thus if you dip one half of a wet cold Sheet in hot Water, wrapping the hot side within the cold, or let a *warm Sheet* that is contorted cool on the out-side of it, and then wring it as *Women* do Linnen, the Water that first exudates will be cold; for in this *Case* the closing of the *Pores* avails nothing to hinder it, as long as the expressing *Force* masters it; more especially in *Animal Bodies*, wherein the Parts are so contrived, that *Humours* design'd for *Excretion* cannot well return, and therefore must, upon *Contraction*, run out.

Hence it is that *Alum*, or *Vitriol*, which are very astringent, and therefore close the *Pores*, will notwithstanding cause the *Mouth*, or *Nose*, to run very plentifully with Moisture, by contracting all the *Membranes* about the *Mouth*, or *Nose*, and thereby squeezing out the *Moisture* design'd to be excern'd, which cannot return, because the *Parts* are contriv'd against the return or readmittance thereof; whereas *Alum*, or *Vitriol*, will stanch or stop *Bloud* by the same *Contraction*, because it may return (as not being design'd to be excern'd) either into the *Arteries*, and so pass by other *Branches* thereof, or (which is more ready and natural) keep its course into the *Veins*. So the two *Riddles* (that I have known some *Proud Physicians* amaz'd at, tho' but *Trifles*) of *Alum* and *Vitriol* causing the *Spittle*, &c. to come out, instead of stopping it by their *Astringency*, and their stopping *Bloud* at *Nose* at the same time they cause the *Snot*, or other *Humours*, to run out, are unfolded.

13. It is by this mighty *Contraction* growing to an enormous degree, that the *Animal Spirits* being violently compressed, grow exceeding irrequiete, as upon *Convulsions* in great *Pain*, or very grievous
Sensa.

Sensation at *Stomach*, &c. while the *sensitive Soul* compressing them with mighty *Force*, and somewhat disorderly and unevenly, because of the *Confusion* and *Hurry* he is in to relieve the *Animal*, they by their springiness fling up and down with great *Vigour*. This makes *convulsive Motions* have great *Strength*.

14. The Body under this *Contraction* is manifestly shrunk by measure, especially when the Sensation is very grievous, but most of all if they cause a *general Convulsion*; which I manifestly observed in a little Bitch, that was convulsive all over for three Hours, and was just expiring, when I gave her the *Sal Volat. Oleos. of Opium*, which perfectly restored her by relaxing the Vessels.

Some may think it strange, That *Nature* should contrive a more nice and smart Sensation (which the *Contraction* of the *Vessels* of the *Animal Spirits* must cause by compressing them, &c.) in *Pain*, and by it; which becomes so much the more acute; whereas one would judge, That *Nature* would rather contrive its *Ease* than improve its *Smart*.

You are to know, That the *Pain* is in order to relieve the *Animal*, by exciting all its *Powers* to defend, expel, or reject the *Cause*; and that, without a *grievous Sensation*, the *sensitive Soul* is neither minded nor excited to do it; and the more the *Pain* is, the more it is stirr'd up to *Self-preservation*, and (as was shewn) the more vigorous do its *Motions* grow by the *Compression* of the *elastick Spirits* to perform that *Work*; so *Nature*, not regarding the *Pain* (which is rather for good) as much as taking away the *Cause*, advances that, for this *Purpose*; like a wise *Physician*, who finding a *Grievance* at *Stomach*, not sufficient to excite effectual *Vomiting*, to throw away the grieving *Cause*, adds to the *Grievance* by giving a *Vomit*; which because (as was said) *Nature* is
propor-

proportionably excited to, and invigorated for *Self-preservation*, sufficiently solicites and enables it, by a stronger *Contraction*, to reject the *grieving Matter*.

As the greater the Relaxation is, the more is the Rest of all Parts; and the weaker the *Animal Spirits* (because less compressed) the gentler are all Motions, (as you see in *Sleep*) consequently the less is the *Expence* of *Spirits*; so that in *Sleep* we generate more than we spend, and are thereby recruited: So the more the *Contraction* is, the more violent is the Motion of the *Heart*, *Intestines*, and of all Parts, and consequently the *Expence* of *Spirits* is the greater.

Therefore it can be no Wonder, That *Contractions* do cause great *Commutations* of *Spirits*, *Diary Fevers*, &c. when you consider,

1. That the *sensitive Soul* is, by the *grievous Sensations*, &c. that cause them, put upon a great Fret, Concern, and Hurry, to defend the *Animal*, and lays about him all manner of ways for *Self-preservation*.

2. That the *Animal Spirits* are, by means of great *Compression* caused by the *defensive Contraction*, in a very forcible *Springiness*, which causes all the Actions that are continual, involuntary, and of course, to be perform'd with great Violence, proportionable to its compressed Elasticity. Besides that,

3. The *Systoles* of the *Heart* are oftener repeated. All which conspire to cause greater *Commutations* upon *grievous Sensations*, whereby *Diary Fevers*, &c. are caused, which are easily and naturally cured by *Sleep*, or *Relaxation*, at present compose and quiet those *Perturbations*. Who knows (tho' it is not my *Business* to discuss it at present) but that the *Contractions* in the cold *Fits* of *Agues*, have a great hand

hand in causing the *hot ones*? How otherwise should *Opium*, by only taking away the grievous *Sensation* of the *cold Fits*, take off, or prevent the *hot Fits* also? But of this, in my often-mentioned *Tract*, (though not so often as it grieves me that it is not published.)

How reasonably may we now expect, That pleasant *Sensation* may cause quite contrary Effects to that of *grievous Sensation*? viz. *Relaxation*, and all its *Effects*, (which have been in some measure enumerated in the *Case of Natural Sleep* in this *Chapter*) viz. *Satisfaction*, *Composure of Frets* and *Commotions*; as of *diary Fevers*, *hysterick Fits*, &c. *Perspiration*, *quieting of Vomitings*, *Hiccoughs*, &c. *lessening of Feeling*, and consequently a stop and *moderation of all Fluxes* that depend upon *Irritation of Humours*, as *Diarrhea's*, *Dysenteries*, *Catarrhs*, *Vomitings*, *Driness of the Mouth*, (as in *Sleep*, for want of the *Contraction* to squeeze the Spittle out of the *Glandules* into the *Mouth*) *Nocturnal Pollutions*, &c. But of the *Nature and Effects of Pleasure*, you'll find more in the next *Chapter*.

Besides the *Vigilative* and *Defensive Contractions*, (which seem to be Things of course upon *Waking* and *Grievances*) the *sensitive Soul* has a *Contraction* at *Will*, as that of the *Pupilla*, when an *Animal* is intent upon *Seeing*; of the *Tympan*, when intent upon *Hearing*; of the *Muscles* of the *Legs*, when intent upon *Walking*; and so of all the *Muscles* of the *Body*, which I call *Intentive Contraction*, that he can perform either along with, or without the other *Contractions*, or without any great degree thereof, as when one is considerably relaxed with the *Pleasure of Wine*, *very good News*, &c. nay, sometimes even in *Sleep*, as is manifest by the *Noctambuli*, (or such as walk in their *Sleep*) and such as speak,

speak, strike, &c. while asleep: And as the *Defensive Contraction* does all it can in our *Defence*, without the *Direction* of the Will, as in *Vomiting*, *Sneezing*, *Purging*, &c. upon *sensible Irritation*; so this *Intensive Contraction* does all it can to the same Purpose, by the *Direction* and *Dictates* thereof.

Note, That insensile growing Things that do not move, as *Trees*, &c. have none of these *Contractions*, but what happens by *Cold*, and *Compression* of the *Atmosphere*, which are sufficient it seems for *Nutrition*, but not for *Sense* and *Motion*; it follows, That in compleat *Synopes*, when the *sensitive Soul* gives over all *Contractions*, that we are much in the state of a Plant.

All those three *Contractions*, viz. the *Vigilative*, *Defensive*, and *Intensive* do, because they promote *Motion*, and cause it more or less, (as you find the *Vigilative* causes much more of it than *Sleep*, and the *Defensive* more than that, &c.) spend the *Spirits*, cause *Weariness*, &c.

The *Vigilative Contraction* does of it self, without any considerable *Grievance* or *Labour*, that is, without the *Defensive* or *Intensive Contraction*, tire the *sensitive Soul* in about 16 Hours: Hence it is that the idlest Person, that is most free from *Care*, *Trouble*, or *Pain*, cannot well hold out without the *Recruit* of *Sleep* any longer.

The *Defensive Contraction*, or that of *Grievances*, being added to the *Vigilative Contraction*, the *Spirits* are faster spent, and the Person tired proportionably sooner, according as the *Grievance* is more or less, and consequently the Endeavours of the *sensitive Soul* to be rid thereof.

To

To both which *Contractions*, (*viz.* the *Vigilative* and *Defensive*) if you add the *Intentive*, (or *Labour*) then are you sooner and more tired than by only those two former *Contractions*; for this last Case is labouring in *Pain*, (or under a *Grievance*) which notoriously tires Man or Beast sooner than ordinary: The direct contrary to which, is sleeping soundly and sweetly, without *Trouble*, *Pain*, or *Dreams*; for a *dreaming Condition* has too much of the *vigilative Contraction* in it, to be pure *Relaxation* and *Recruit*.

Now according as these *Contractions* are, or are not added one to another, we are sooner or later before we are tired, (speaking generally, and not considering *Custom* and *Habit*, which concerns us not.)

You see that all the three *Contractions* concurring, do soon and sadly tire us, that no two of them tire us as much as the three together; that is, neither the *Vigilative* and *Defensive*, without the *Intentive*; nor the *Vigilative* and *Intentive*, without the *Defensive*; and the *Vigilative* alone least of all: Yet allowance must be made for the Intensity of the *Defensive* and *Intentive*; for either of these two being very intense, may tire as much as both, in a moderate degree: Thus a Man may be tired with violent Labour in four Hours, tho' not in *Pain* as much as one that moderately labours in some small *Pain* for the same time.

Observe, That we recruit in eight Hours (generally speaking) as much by relaxation in *Sleep*, as we spend by *vigilative Contraction* in sixteen: I take the Reason of that to be, That *Relaxation* widening all the Passages of the *Body*, the *Nutrient* is admitted into them more fully and freely;
as

as the *Bloud* is into the *Skin* in *Sleep*, and all *Relaxations*, which cause an *Efflorescence* thereof in those *Cases*. Hence it is that we are so much recruited and nourished in *Sleep*; that *Children* grow more than others proportionably; that *Relaxers* cause the *Breasts*, &c. to grow.

Note, What a mighty *Restaurative Relaxation* is! By its help, for *eight Hours* in *twenty four*, we can watch all, and labour most of the other *sixteen*, all the *days* of our *Life*: It follows, That if we could any way half relax the *vigilative Contraction* while we *Labour*, take a *Journey*, or the like, that we might perform prodigiously, without being tired. Hence it is, That because *Pleasure* (as has been intimated *relaxes*, as *Grievances contract*, (of which you may expect farther *Proof* in the next *Chapter*) that such as work, or travel, pleasantly diverted all the time, are tired very little or nothing in a long time; and that some will dance whole *Nights* with sweet *Musick*, and agreeable beloved *Company*, without being so much tired, as they would be if they us'd the same *Motions* for a quarter of the time without either of the *pleasant Diversions*. The like is to be said of any other *Pleasure*, as drinking a good *Glass* of *generous Wine* every half hour, or so often as to continue the *sense* of its *Pleasure* at *Stomach* all the time they labour or travel; for 'tis a *vulgar Errour*, (tho' the universal *Sentiment* of *Mankind*, both *Learned* and *Unlearned*) That *Wine*, *Cordials*, &c. do comfort, elevate, and excite the *Spirits*, (as 'tis call'd) by adding their *Spirits* to, or joining them with ours; whereas it is only by causing a *pleasant Sensation*, particularly at *Stomach*: For which *Paradox*, I am obliged (tho' in great haste to come to the *Explication* of *Opium*) to give my *Reasons*, which are as follows, *viz.*

1. It cannot be imagined how a *sensitive Creature*, as such, can conceive any *Comfort*, or be sensible thereof, but by *Sensation*: To say he is comforted, and not sensible of the *Comfort*, is a *Contradiction*; for *Comfort*, as such, belongs to a perceiving *Being*; and an *Animal*, as such, perceives nothing but by the *Senses*; and therefore there can be no *Comfort* but by *pleasant Sensation*; nay, as such it is his *Comfort*: So *Musick*, *pleasant Sights*, *Odours*, and agreeable *Objects* of all the *Senses*, are comfortable, because *pleasant*. I hope that none will say, That *Musick*, *Sights*, *good News*, &c. (which highly comfort) have any *Spirits* to add to ours: The truth is, That *God* and *Nature* have given us our *Senses* for that end, and present *Refection* in Cases of *Faintness*, *Depression of Spirits*; And what more proper to convey *Comfort* to us, than what is sensible of it?

2. It is another thing to add by way of *Nutrition* to our *Spirits*, (which are insensible Things, and therefore never properly comforted any more than a *Plant*, that is nourished as well as they :) But the *sensitive Soul* being pleased, must needs conceive *Satisfaction*, *Comfort*, *Joy*, &c. How he can be pleased when sensible of nothing, I know not; nor how he can be comforted without being first pleased, nor how pleased but by *Sensation*.

3. The *Essence* of *Animal Comfort* does not consist in having many *Spirits*; for one in most grievous *Pain* and *Misery*, by which he is much discomforted, cast down, depressed in Spirit, &c. may have great plenty of *Spirits*; and one that has not half as many, highly comforted, by pleasing *Objects* of *Sense*, *good News*, &c.

4. If we staid for *Comfort* by a *Meal of Meat*, &c. till it added to our *Spirits*, we might stay long enough; nay, if we staid for *Comfort* till
we

we found it by that *Addition*, we should never find it; for we cannot in that case find what we do not feel: We possibly, after two or three days eating and drinking, may find our selves stronger; but (after all) suppose us in very great misery at the same time, Where's the Comfort of it, when the Spirits are otherwise depressed by *Pain*, *ill News*? &c.

5. Hunger is a *grievous Sensation* at Stomach; which is cured, and we comforted, by causing a *pleasant Sensation* by *Meat*, *Wine*, &c. instead thereof; and not by adding *Spirits*, which is a great Mistake. It is true indeed, that we are comforted, but it is most manifestly by pleasing the *exquisite Sensation* at Stomach, which God has placed there for that *End*: Hence it is that all *Cordials* must be pleasing to the Stomach, or else they are no *Cordials*; and that *Wine*, and all such Things as please the Stomach, are apt to take away much of the *Sharpness* of Hunger, for a time at least.

6. How should *Wine*, which has a great Acidity in it, and so very good for *Digestion*, cure a *canine Appetite*, which is a *grievous Sensation*, but by causing a pleasant one in its room, by which means the *grievous Sensation* is taken off? For *Pleasure* and *Grievance*, (or *Displeasure*) which are *Contraries*, cannot be in the same *Subject* at one time. Thus it is that *Opium* takes off Hunger, *canine Appetite*, &c. But of this hereafter.

7. How should a Quart of Wine; drank in a minute or two, have all the *comfortable Effects* of *Wine* in a quarter of an hour while it is at Stomach, if it were to stay for this Comfort till it added Spirits to ours, since the matter of *Effluvia*, or *Fumes* passing into the *Bloud*, is disproved?

8. Why should our *Comfort* be so great while it is at *Stomach*, and none by that time it is got into the *Bloud*, but that the *Stomach* being very sensible, the *Spirits* of the *Wine* do highly please by their *Agreeableness* thereunto? It matters not whether it had *Spirits* or no, so it caused a *pleasing Sensation*; for a *Draught* of *Water* in a high *Fever*, and when we are very faint with *Thirst*, very much comforts us without any *Spirits*, as does a *Venison-Pasty* a hungry Person, by *agreeable Sensation* taking off the *grievous Sensation* (called *Hunger*) and all its consequent *Faintness*, &c. before it can add any *Spirits* by *Nutrition*.

9. What need we seek any farther? Do not we find a *pleasing Sensation* at *Stomach*, when we are comforted with any thing, and the *Comfort* to bear a *Proportion* to the *Pleasure*?

10. Are not we *prompt*, *blithe*, *gay*, and *brave*, while the *Wine* is at *Stomach*? And very often fit for nothing, *dull*, *heavy*, *mopish*, &c. by that time it is got into the *Bloud*?

Therefore we may safely conclude, That the *Spirits* of the *Wine* do comfort us, by causing a *pleasing Sensation*, and not by adding its *Spirits* to ours, according to the settled *Sentiment* of the *World*, that is not yet arrived to the *Learning* or *Knowledge* why the most common *Cordial* comforts them. What *Spirits* has a *Grain* of *Opium*, while at *Stomach*, to add to ours; or can it add, if it had them? Yet no *Wine* comforts us as much as *Opium*, because it pleases us so much, (as was and will be yet much more fully shewn.)

Note, That besides what was said of the *Grievousness* of the three *Contractions*, to tie the *animal* or *sensitive Soul*, he is much depressed and cast down, upon the *Perception* of *Grievances*, as *Hunger*, *Pain*, &c. Because they, 1. Affect him with *Grief*
and

and Displeasure, and consequently with Discomfort, Anxiety, &c. because of the very Dolour. 2. With Care and Solitude how to be rid of it. 3. With the Toil of Defensive Contraction to endeavour it.

All which causes Melancholy, Depresson of Spirits, Pusillanimity, Perturbations, Frets, Discomposure, Dissatisfaction, Anxiety, Solitude, Peevishness, Discomposure, Discomforts, Listlessness, &c. as you see in such as are Hungry, or in Pain; to which if you add the Fatigue and Effects of the Defensive Contraction, and the Intensive, as far as it is exercised for Self-preservation in this Case, you may (observing what has been said) easily solve all the Phenomena's of grievous Sensation, and as easily conclude what must be the Phenomena's and Effects of pleasant Sensation, by the Rules of Contraries, viz. Satisfaction, good Humour, Ease, Comfort, Ovation of Spirits, Relaxation, &c. of which we are going to speak.

C H A P. XIV.

Of the Nature of Sensitive Pleasure, and its Effects upon the Animal, as far as it concerns our present Purpose.

S*ensitive Pleasure is a Complacency of the sensitive Soul, resulting from the Agreeableness of the Object to the Organ of Sensation: Thus are we pleased with what is agreeable to the Eye, Ear, Tongue, Stomach, &c. And what is agreeable to those Organs, is agreeable to the Animal in general: 1. Because God has made and appointed them (especially the sensible Membrane at Stomach) to be as it were the Touchstone of what is agreeable to the Animal. 2. Because the Membranes (or Organs) are of the same active Principles with the Animal's Body in general; otherwise they would not be fit Tasters, Triers, or Touchstones of what is good or bad for the Body in general.*

Now the active Principles of the Membranes, (or Organs) are Volatile Salt and oily Parts, or a Sal Volatile Oleosum, which is predominant in them, and all the Parts of the Body; therefore such Things as have a Volatile Salt join'd with some oily Parts, must be in a special manner agreeable and pleasing to the Membranes; for simile simili gaudeat.

Hence it is, That what abound in Volatile Salt, as Snails, Earthworms, and Things of that kind, are such fine Anodynes, and so pleasing to the Membranes, &c. That the Seed of Animals, which is a Sal Volatile Oleosum, and Things of that nature, as Onions, Garlick, Rocket, Sives, Bears-Garlick,

Isok, Oysters, Cockles, Shallot, &c. do so please and tickle the *Venereal Membranes*, and thereby excite *Venery*; and that such Things are generally so very agreeable to the *Stomach*, (with which we are mainly concerned, as the Chief Judge of what is agreeable to the *Animal*) and so main Ingredients of *Relishes, Sauces, &c.* to render them pleasing to it.

Here it is obvious to note, (what is also very commonly observed) That the most pleasing Things to the *Stomach, Venereal Membranes, &c.* have those *Principles* more active, warm, and tickling, than the *Membranes* themselves, because the *sensitive Soul* is highly pleased with what finely actuates, tickles, and causes an Ovation of the *Spiritus insiti* of the *Membranes*. Hence bare Warmth is so very pleasing, as are also gentle *Frictions* of the *Head, Back, &c.* for the same *Reasons*.

1. The oily Parts (as all know) do please the Feeling (with which we have to do) by their smooth, gentle, and soft touch. Thus Milk, Emulsions, and other *Anodynes*, as the Root and Flower of *Water Lily, White Lily, &c.* become agreeable to the *Membranes*, and therefore relax and ease *Pain*. Hence it is that all *Aliments* have an agreeable Sweetness, the Pleasure whereof takes off the grievous Sensation called Hunger.

But the Pleasure of oily Parts, because they do not so actuate, stir, and titillate the *Spiritus insiti*, is but flat, slow, and dull, without they are joined with some other Particles that are pleasing to the *Membranes*, that actuate and finely titillate the *Membranes*, and *Spiritus insiti*; therefore to make them highly and charmingly pleasing, they should have join'd therewith,

2. *Volatile Salt* being a more active agreeable Principle, which may finely and pleasingly excite, actuate, titillate, and cause an Ovation in the *Spiritus insiti*, as Onions, &c. at Stomach, Sem. Animal, upon the Venereal Membranes, &c.

But, as was said of the Oily Parts, That they cannot cause so exalted a Pleasure without the *Volatile Salt*, so the *Volatile Salt* alone, or too little qualified, and smooch'd over with Oily Parts, is too rude, pungent, or acrimonious, as in *Cantharides*, *Bees*, *Pismire*, *Asarabacca*, *Spearwort*, *Crowsfoot*, and other Vomitory Volatiles, which becomes so by over-stinging the Membranes, and stirring the *Spiritus insiti* overmuch into a sort of Fury, instead of an agreeable Ovation.

It follows therefore, That it is neither Oily Parts alone, which if too much, often nauseates the Stomach, nor *Volatile Salt* alone, no nor every Mixture thereof, but a certain due Proportion of both, so as to have the *Volatile Salt* somewhat more predominant than in our Membranes, that it may comfortably actuate, titillate, and excite our Spirits, as Warmth, Frictions, &c. do, must cause the most charming and exalted Pleasure; For Things exactly of the same degree of Oil and *Volatile Salt*, with our Membranes, can cause but a slow Sensation, because they make little or no Alteration therein, which is one of the great Requisites of Sensation; for that which makes no Alteration, as the *Saliva* in the Mouth, the same degree of Light that is in the Eye, of Sound as in the Ear already, &c. cannot be perceiv'd, because where no Difference is made, nothing can be perceiv'd, for the Organ is affected but as it was before the Object was offer'd, and consequently we cannot perceive that any new thing was objected, and therefore cannot be at all sensible thereof; so if it makes but

a small *Difference*, the *Sensation* can be but slow, and slight Proportionably, as of a little degree of *Light* more than is in the *Eye*, &c. for it is only that little that is perceived; for (as is notorious to all who understand any Thing of these Matters of *Sensation*) it is only the *Excess* of *Impression* to what was upon the *Organ* before, that is perceived; for that is all that is *new* above what was thereon before, and therefore all that is to be, or can be perceived more than was before (as was said.) Hence it is, that *Flesh* or other *Things*, that have the *Sal-Volatile Oleosum*, or the same *Principles*, that the *Membranes* of the *Stomach*, *Venerial Parts*, &c. have, in much the same degree, affect them but with a gentle *Pleasure*. Therefore we must have such a mixture wherein the *Volatile Salt*, as in *Semine Animali*, *Onions*, &c. is sensibly more active than in our *Membranes*, to actuate the *Spiritus insiti* of the *Membranes*, and cause an *Ovation* therein, which is (as was said of *Comfortable Warmth*, *Frications*, &c.) very agreeable and pleasant to the *Sensitive Soul*, who looks upon such as friendly and active *Auxiliaries* to our *Spirits*, whereas the other are as *lazy Friends*, wherein he takes not the like *Complacency*; You may perceive much of the *Difference* in this Case in *Mustums*, (or new unfermented *Wines*) which indeed do lazily please by their acceptable *sweetness*, but do not so actuate the *Spiritus insiti* as the same *Oily Parts* when rendered active, *spirituous*, and nearer the Nature of actual *Heat* after *Fermentation*; which then being very readily actuated by the *Heat* of the *Stomach*, do briskly and chearfully return the *Kindness* by actuating our *Spirits*, and putting them into a pleasing *Ovation*, of which I could give you a very pat and pregnant Instance in a Thing actuated into a very high degree of pleasing by *Frication* and

Agitation, which was otherwise almost insensible ; but Modesty forbids me.

Note, How the sluggish Oily Parts in *Mustums* do, by being *spiritualized* by *Fermentation*, as it were, supply the place of *Volatile Salt* in *actu-ating*, and in some measure *titillating*, tho' not to that high degree as the more *poinant* *Volatile salt* in *Semine Virili*, and the like, because the *Sulphureous Oily* Particles, however separated, disgre-gated, and set at at liberty by *Fermentation*, re-tain much of their smoothness, and never can arrive at the *titillating* Power of *Volatile Salts*, as is evident in *Ampbrodisiacks* upon the Account of *Volatile Salts*, as *Cantharides*, *Bees*, *Pismire*, &c. which *Wine* in 100 times the quantity cannot e-qual in *Tuillation*.

Nor is it enough to have the *Sal Volatile Oleo-sum* duely qualified, as to the *Quantity* and *Quality* of both the *Oily* and *Saline* Parts, and these pre-dominant, and of a fine brisk and gently tickling Activity ;

But the *Oleous* and *Salino Volatile* Parts should (to make a compleat and permanent *Pleaser* of the *Membranes*) be very intimately combined, so as not easily to separate one from the other, o-therwise they will not duely conspire and co-o-pe-rate to cause the *Pleasure*, but the *Volatile Salt* will act separately as such, that is *irritating*, and not finely and pleasantly *Tickling*, as *Semen Huma-num*, &c. wherein the *Oil* and *Volatile Salt* are firmly join'd together.

I therefore conclude, That the most excellent Thing to please the *Membranes*, must be such as *Semen Humanum*, that is, not too *Oily*, (for then
it

it would not sufficiently please by a fine *Titillation*, and actuating of our Spirits) nor too full of *Volatile Salt*, as *Mustard*, *Asarabacca*, &c. nor have too *accrimonious* a *Volatile salt* with too little *Oleous Parts* to correct it, for in both these last Cases the *Irritation* would be *grievous*; nor have the *Oleous* and *Volatile* loosely combined. But,

That it should be a *Sal Volatile Oleosum*, where-
in the *Volatile Parts* are *brisk*, and somewhat more
active than ours, yet so corrected by *Oleous Parts*
intimately combined therewith, as to render it of a
most agreeable and pleasant *Titillation*, such as would
please all *Membranes*, but especially those that have
most acute *Sensation*, as the *Stomach*, and *Vene-*
real Membranes, (both which *Opium* most sen-
sibly pleases) which are ordered so to be for *Pre-*
servation of the *Individuum*, and *Species*, the one
to invite us to *Eat*, and the other to *Procreate*;
But to satisfy you yet farther, as to the *Stomach*,
which concerns us mostly,

Note 1. That the more exalted and intense the
Pleasure is, the higher are its *Effects* upon the *Sen-*
sitive Soul in pleasing, comforting, and elevating
it; and upon the *Body*, in relaxing all the *Sensile*
Parts thereof, as that of *Wine* is higher than that
of *Mustum*, &c.

Note 2. That the better the *Organ* is disposed
for *Sensation*, the higher the *Pleasure* or *Displeasure*
is; for he that has his *Nose*, *Tongue*, *Ear*, *Mem-*
branes, &c. ill disposed for *Smelling*, *Tasting*, *Hear-*
ing, *Feeling*, &c. has not so much *Pleasure* in sweet
Odours, good *Tastes*, *Musick*, *Pleasers* of the *Feel-*
ing, &c. nor so much *Displeasure* in bad *Scents*, &c.
It follows,

Note 3.

Note 3. That *cujus est Dolor ejusdem est Voluptas*, that is, the Part or Membrane that is capable of intense Pleasure, is so of intense Pain or Displeasure. For Instance, If the Stomach be capable of great Grievances, it is so of great Pleasure, God having distributed them also equally.

Note 4. That, since the great Use, End, and Business of Sensation, is to give notice, and inform the Animal of what is, or is not good and agreeable to it, it follows, that the Wisdom that made us would place the most exquisitely and critically disposed Organ (or Membrane) of Sensation, where such notice is most requisite and useful; and consequently there must be more Pleasure or Displeasure conceiv'd at Things agreeable or disagreeable, that the descending and relieving Motions and Comfort, may be proportionable.

Note 5. That such exquisite, exact, and nice Notice is most requisite at Stomach.

First, Because all our Nutriment, good and bad, is to pass that Way to be Judged of.

Secondly, Because it is the last Part that it arrives at before it receives a considerable change; for when it is changed, no such true and sincere Judgment can be given thereof, as could be before.

Thirdly, Because the Faults, Defects, or Negligences of the Taste, and the External Senses, are to be remedied and corrected there, or no where, therefore the Stomach is as the last Judge of Appeal, and should be most exact and infallible in Judging; or as the last inner, or Main Guard in a Fort, Town, or Castle, which if the Enemy pass, the whole is endanger'd, if not lost.

Fourthly, Because the Concern being so great, Sensation should be the more exquisite there, to excite the Animal Powers to make Defence, by
repel

repelling, rejecting, or detruing the *Enemy*, which *Powers* (as has been intimated) are excited according to the *degree* of *Sensation*, especially seeing there is no voluntary *Power*, or *Contraction* of the *Stomach*, but only the *Natural*, which is always excited by *Sensation* in such Cases, or not at all.

Fifthly, *Sensation* should be *critical* and accurate at *Stomach*, to inform us precisely when we should Eat or Drink.

Sixthly, To inform us exactly when we have Eaten or Drank enough; for all this is done by *Sensation*.

Therefore God has placed a most *Sensile Membrane* at the *Stomach*, as most manifestly appears;

First, By its taking, and giving notice of such Minute Things, that no *Sense*, *Part*, *Organ*, or *Membrane* can; for it takes notice of, and informs the *Sensitive Soul* (as has been said) of the *Vomitory Particles* of the *Crocus* and *Regulus* of *Antimony*, which are so indefinitely small, that no other *Membrane* or *Organ* of *Sensation*, but that at *Stomach*, can take notice thereof, because the *Crocus* and *Regulus*, after they have afforded 1000 *Vomits* from their Bodies, are not sensibly diminished either in *Weight* or *Bulk*; nor doth the *Stomach* take and give a slight, but very remarkable notice thereof, that is sufficiently powerful to excite not only all the *Natural Powers* of the *Part*, and of all the *Auxiliary Muscles* that usually assist to *Vomit*, but to cause a *Contraction* (and that very often strongly *Convulsive*) of all, or most of the *Muscles*, and *Membranes* of the whole Body, so great is the *Sway*, or *Regimen* of the *Stomach*, by virtue of its exquisite sensibility.

Secondly,

Secondly, By its giving notice of inimicous Particles, and very tenuious Effluvias, that fly in the Air, which no Organ of Sensation, or Membrane, but that at Stomach, can observe. For Instance, Some that hate Cats very much, will know, that there is a Cat in the same Room with them, tho' silent, and shut up in a Trunk or Cupboard, where neither the Eye, Ear, Nose, Taste, or immediate Feeling, can be at all concerned or affected. That it is the Stomach that is affected, is apparent, (tho' a Thing not thought of;) 1. Because the first notice they have is plainly at Stomach by a kind of faint Distress, not unlike a beginning Nausea; If the Curious will enquire, they will find it to be as I say. 2. Because all Perception of Material Things is by Sensation, and that it is evident no other Organ of Sensation, or Membrane, is concerned. 3. Because, if the Cat continues in the Room, and is not removed, they fall a Vomiting, or into Anxieties or great Distresses at Stomach, or Faintings and Syncopes, which are the common and known Effects of a grieved or oppressed Stomach.

Just so does it (tho' these Things are not, or not duely observed) take, and give notice of Pestilential Effluvias, which cause the like Faintings, or a kind of Nausea at Stomach; Thus People discern that they are (as they call it) Plague struck, and often fall (as in the Case of the Effluvias of the Cat) into dangerous Deliquiums and Syncopes, of which many in Plague Times suddenly dye, as Cat Haters would (for ought I know) if they continue long in the same Room with a Cat, as they do with Pestilential Effluvias; Therefore it were good presently to remove them from the Place wherein they were struck, because the Air (as the Room wherein the Cat is) is fill'd with the perni-

pernicious Particles; for you see in the Case of the *Cat*, that removing the *Man* or the *Cat* gives Relief, and it were better removing the *Man*, but that he is more Cumberfom, because the *Room* is already tainted with the *Effluvias*, and in the Case of the *Plague* it is only the *Person* that can be well removed. This proves how useful Removals may be, and how convenient in *Plague Time* it would be to remove to the *Wind-side* of a *Town* or *City* that is tainted, according as the *Wind* changes, and how convenient *Winds* are to convey away the *Effluviams*, and good *Stomachick Cordials*, that are warm and pleasant, to fortifie the *Stomach*, and open the *Pores*, which all Things that cause a sense of *Pleasure* do, as *Wine*, *Spirits*, &c. to which if some good Preparation of *Opium* were added, it would be most convenient. How many *Stories* have we of *Persons* well fill'd with *Wine*, who wonderfully escaped *Infection*; I pray God this *Hint* may be improv'd to the *Preservation* of *Mankind*; Therefore I add, that much may be in a good *Quantity* of *Wine* in this Case; 1. Because, *Quod intus est prohibet alienum*, that is, *What is within hinders ingress of another Thing*. 2. Because the *Perspiration* will be the greater, both upon the Account of the greater opening of the *Pores* by the *Pleasure* of the *Wine*, and the greater *Quantity* of Matter to be perspired carry off the *venemous Particles*. 3. Because the *Sensitive Soul* is thereby much comforted, refreshed, and invigorated; but I would have the *Wine* so used, as to keep a continual *Warmth*, *Pleasure*, and *Comfort* at *Stomach*, which is the main Cause of all the good; I think a *Glass* every Hour, after taking 2 or 3 at first, may hit the Mark best, the Reason of which will appear hereafter.

Thirdly,

Thirdly, The *Stomach's* exquisite *Disposition* to *Sensation*, above all other *Organs* and *Membranes*, appears by this, viz. That the *Offences* of the other *Organs* of *Sensation* (even by their proper *Objects*) do often affect the *Stomach* more than those very *Senses* or *Organs* themselves. For Instance, If we smell a great *Stench*, the *Stomach* is often more offended thereat than the *Nose*, as is manifest from the *Vomitings*, *Faintings*, and *Deliquiums* that are caused by the *Stomach* upon that Account; so the bare *Seeing*, *Feeling*, and *Tasting* of a nasty Thing, do cause *Nauseas*, &c. at *Stomach*, yea, the very naming of such Things has much offended it, and caused such *Effects*, which may be thought very strange, considering that there pass no *Effluvias* from the sound of *Words*, but the *Reason* will appear in the following *Paragraph*.

Fourthly, All *Passions*, *Commotions*, and *Perturbations*, that happen in the *Body*, do often affect the *Stomach*, and sometimes so grievously, as to cause *Nauseas*, *Vomitings*, great *Anxieties* at *Stomach*, *Faintings*, &c. Thus *Fear*, *Terrour*, *Surprizes*, *Anger*, *Grief*, *Pain* in other Parts, &c. causing some Motion in the *Animal* more than ordinary, (of which the *Stomach* being sensible) do cause the aforesaid Disturbances; Therefore it is no Wonder, if the *Hearing* one mention a Nasty Thing, which causes an *Abhorrence*, and the *Motions* consequent thereunto, should (as was said in the precedent *Paragraph*) cause the nice *Stomach* to be offended.

It is most manifest from the *Premises*, that no *Organ* or *Membrane*, can compare with the *Stomach*, as to its exquisite *Disposition* for *Sensation*; it follows then,

That

That Grievances or Pleasure at Stomach must have the greater Effects;

1. Because the Intensity of either will be proportionable to the Sensation.

2. Because the Powers of the Animal that are to defend it (which are Contractions) are affected according to the Sensation, and that it is there most requisite sensibly to affect them.

3. Because what affects the Stomach influences the whole Animal, more than the Sensation of any other Part.

4. Because of the considerable Stay that Things make at Stomach to cause Grievance or Pleasure, whereas that of Pleasure is generally very momentary in other Cases.

5. Because, being within the Body, we carry our Pleasure or Grievance with us, (as a *Vade Mecum*) wherever we go, and therefore,

6. It is a Pleasure, &c. that cannot so well be taken away from us, as that of the Tongue, Ear, Nose, Eye, &c. may, by removing the Objects; and therefore it remains with us in our very Sleep, as far as we are capable of Sensation at that Time, causing pleasant Dreams, &c. and so agreeably entertaining us Sleeping or Waking, when the Pleasure of all the other Senses fails us. Which will appear farther hereafter.

The Pleasure at Stomach excels even that of Venus, if not in Intensity, yet in several other Respects, viz.

1. Because of its duration, that of Venus being momentary, but that of Wine at Stomach lasts a good while, and that of Opium many hours, 'tis therefore that the Effects of these Two are more remarkable and taken notice of.

2. Be-

2. Because, that at *Stomach* may be continued as long as we please, by a new supply of *Wine, Opium, Cordials, &c.*

3. Because it may be excited, when, and as often as we please, if we have those *Cordials* at *Hand*.

4. Because it is not attended with any Expence of *Strength, Depression of Spirits, &c.* as that of *Venery*, but the quite contrary, viz. with more *Vigour, Elevation of the Spirits, &c.* one being by *Emission*, and the other upon *Admission* of what is agreeable.

It is for the *several Reasons* contain'd in the *Premises*, that the *Effects* of *Grievance*, as *Hunger, &c.* or *Pleasure*, are more *considerable* and *remarkable* at *Stomach*, and that *Things* agreeable thereto have, by way of *Eminence*, gain'd the Name of *Cordials*; That *Wine, Spirits, Opium, &c.* do cause a more permanent and notable *Gaiety, Pleasantness, Good Humour, Serenity, Promptitude, Ovation of the Spirits, (or Sensitive Soul) Bravery, Courage, Magnanimity, Euphory, or easie undergoing of Business, Relaxation, with all its Effects, as Deadness of the Eye, Dilatation of the Papilla, Perspiration, &c.* which are hardly noted in other *short Pleasures*, unless it be in that eminent (tho' short) one of *Venus*, which is a *Pleasure* of the same *sense of Feeling*, as that of *Opium* and *Wine* are.

Therefore *pleasing the Stomach* is one of the greatest *Things* to be regarded in the *Practice* of *Physick*, to *Comfort, Satisfie, or Compose the Spirits*; by which *Means* I have often performed such *Cures*, that neither I, nor (I suppose) any other, could otherwise perform, namely, *Dejections of Appetite, Untowardness at Stomach, &c.* when

When all the ordinary and usual Means have failed, by asking them what they mostly desired or long'd for, and letting them have it; or if they could not tell of any Thing that they long'd for, I have mentioned to them all the Relishing Things that I could think of, and such as were grateful to the Stomach, till they fasten'd upon somewhat that they liked or fancied, and then being given them, it generally had the desired Success.

The *Stomach* is grieved (for it will concern us to know how, because *Opium* causes *Vomiting*, &c.) generally speaking;

1. By Things hard of Digestion, as heavy Bread, Mushrooms, Rosins, and such like.

2. By Things acrimonious or pungent; as Vomitories of *Asarabacca*, *Groundsel*, *Squills*, &c. which abound with *Volatile salt*.

3. By Things that stick to the Stomach, which often cause most dismal and tedious Vomitings, and (when they fail to relieve, by rejecting the grieving Matter) *Hiccoughs*, *Anxieties*, *Distresses*, *Syncopes*, and sometimes fatal *Succumbencies*, Nature and all Endeavour failing to work any farther for the Animal's Relief; These Things happen most commonly when indigestible Rosin sticks to the Stomach, especially if they be join'd with any Pungent, Volatile, or Acrimonious Particles. Hence it is, that Resinous Vomits are quite banish'd out of the Practice of Physick, and it were well if Resinous Purgers were so also, especially such as have considerable Acrimony, unless given with the Yolk of an Egg, Lixivials, or in Tinctures, with Spirituous Things to keep the Resinous Particles from Coalescence, and adhering to the Stomach, &c.

1. *Note*, (for we shall have some Occasion for it) That Resinous Things, join'd with *Volatile* irritating Particles, have all the ill Qualities aforementioned, viz. *Hardness of Digestion*, *Aptitude to stick* to the *Stomach*, and *Volatile Particles* to irritate and tear its *Coats* all the time they so stick to it; and therefore such Things have dismal Effects, especially in weak *Stomachs* that cannot Digest them.

2. *Note*, That the Distresses at *Stomach*, caused by a grievous Sensation, are of Two sorts; 1. Such as are the Endeavours of Nature, or the *Sensitive Soul*, in Defence of the *Animal*, as all Vomitings, Purgings, Convulsions, Hiccoughs, Throws, Strugglings, Agitations, Contractions, Watchings, &c. which are accompanied with *Melancholy*, *Fretfulness*, *ill Humour*, &c. because of the Grievance. 2. Such as follow the Yielding and Succumbency of Nature, or the *Sensitive Soul*, after being tired and over-born by the *Fatigue* of *Defensive Contraction*; as *Faintings*, *Distresses*, *Agonies*, *Syncopes*, and *Leipothymies*.

3. *Note*, That *Syncopes*, or *Leipothymies*, are caused by the *Sensitive Soul's* being over-born, (as was said) tired, and spent, and giving over his fruitless Contractions, *Defensive*, and *Vigilative*, upon a sudden, as being to no Purpose, as he does gently and gradually give over *Vigilative Contraction* to cause *Sleep*; so that *Syncopes* are only greater, suddener, and more absolute Derelictions of the whole Concern of Contractions: Hence it is, that *Perspiration* is greater in *Syncopes* or *Leipothymies* than in *Sleep*, the *Laxity* of the *Cornea* and the whole *Body* greater, the *Feeling* less, or quite gone, that all *Motions* become much slower, or none, by the want of *Compression* of the *Animal Spirits*, and dismal Derelictions of all Contractions by the *Sensitive Soul*. Hence it is, that all the Effects of *Sleep* are yet greater in *Syncopes*.

4. *Note*,

4. Note, That therefore it seems, all the Difference between Sleep, and a *Leiporhymy*, is, that in this the *Sensitive Soul* quite throws the Reins of Contractions away, and in Sleep keeps hold thereof, and only lets them loose, and as *Reflection* is made, straightens them more and more, till they come to the Degree of *Vigilative Contraction*, which perfectly awakes them; Therefore Sleep grows slighter toward Morning, because *Contraction* gradually comes on. Here you may see (but I must stop lest I run too far) why every Thing that causes *Contraction* of the Sensible Parts, as *Pain*, and all *Grievances*, are apt to awake People, and keep them so, as *Relaxers* cause Sleep, and continue it.

5. Note, That tho' I have particularly spoken of the *Somach*, as being most concern'd, and the best Example of any *Membrane*, yet do not I exclude any *Membrane* from being capable of *Pleasure* by the like Things.

As for the Effects of *Pleasure* upon the *Sensitive Soul*, I have upon several Occasions said, or intimated enough concerning them; and even the *Vulgar* know, that *Pleasure*, or being pleased, makes People good, and gay humour'd; That it elevates the Spirits, raising Courage, (as Wine does) and enables every *Animal* to Labour, or Travel the better, as *Horses* by the Sound of Bells, especially if tunable, and in Company with another Horse that they have a kindness for; How *Soldiers* March more easily with Merry Comrades, that are full of Jests, and pleasant Stories, or with Drums, Trumpets, Kettle Drums, Hautboys, and other Musick that please the Ear; How much more brisk and blith are we in a fair Sunshine, which pleases the Eye, than at other times? Some think, (according to the *Vulgar Errour*) that it

is the *Goodness* of the *Air* does it; but it is plainly otherwise, for you find the change most remarkable in your self just upon going out of *Doors* into the *Sun-shine*, whereas you had the same *Air* in your *Chamber*; nor is that fine *Lightness* of *Humour* to be found, if it be *Cloudy*, tho' the *Air* be better, as may be observ'd by the *Barometer*, and other *Weather-Glasses*; nor in the *Night Time*, nor where the *Sun* does not come, nor are blind *People* so affected, therefore it is the *Pleasure* of the bright *Sunshine* that causes it.

If *Mean*, *Slight*, *Transient*, and *External Pleasures*, cause such *Effects*; how much more then will an *intense*, *internal*, and *continued Pleasure*, upon the most exquisitely disposed *Part* for *Sensation* of all the whole *Body*, which is mainly design'd for those *Purposes* of *Pleasing* and *Comforting*, to invite us to nourish our selves, and to satisfy the grievous *Sensations* of *Hunger* and *Thirst* by the *Pleasure* of *Meat* and *Drink*, such *Pleasant Effects*? Thus the *Pretfulness*, *Peevishness*, *ill Humour*, *Melancholy*, *Puffanimity*, *Inaptitude*, and *Listlessness*, that attend the grievous *Sensation* of *Hunger*, are taken off, and cured, by the *pleasant Sensation* that a good *Meal*, or some *Glasses* of *Wine*, do cause; Hence it is that we cannot Sleep when *Hungry*, because *grievous Sensation* contracts the *Sensile Parts*, and are apt to it after *Meals* (the *Pleasure* of which relaxes us) if we sit, or lie quietly, and silently; but if we do not, we are more lively, and fit for *Business*. *Instances* of this *Kind* are so numerous and *notorious*, that I need say no more of the *Effects* of *Pleasure*, in causing a good *Humour*, *Elevation* of the *Spirits*, *Satisfaction*, *Content*, *Composure*, &c.

Is it possible that one should be *highly pleased*, and not *take Comfort* therein; *take Comfort*, and not be *elevated in Spirit*, well satisfied, and contented?

Therefore it is *strange*, and *very strange*, that People should leave *Wine, Cordials, Meats, Spirits, &c.* actually, and sensibly pleasing, satisfying, and comforting us at Stomach, (where there is a *Membrane* most exquisitely disposed for *Sensation*) and run after *Fumes* and *Effluvias*, (that were never in our Case in being) to the *Brain*, or *Blood*, that have no sense to entertain them, and consequently can receive no *sensible Comfort* by them; If this be not seeking a *Needle* in a *Bottle* of *Hay*, where it never was, when it sticks most sensibly in their *Fingers*, nothing is. We should think it a *strange ridiculous Action* in a *Child* or *Natural Fool*; but great is the *Privilege* and *Authority* of the *Learned*! So much may suffice as to the *Effects* of *Pleasure* upon the *Sensitive Soul*.

As for the Effects of Pleasure upon the Body, it is Relaxation of all the Sensitive Parts thereof, as appears;

1. Because it's contrary, viz. *Displeasure*, or *sensitive Grievance*, causes *Contraction*, (as has been manifestly shewn.)

2. Because it causes a liberal *Perspiration*, which is a certain *Effect* of *Relaxation*, (as the Want of it is of *Constriction*) and that it causes *Perspiration* is most certain by *Statick Experiments*, and *Demonstrations*. *Sanctorius, Sect. 7. Aph. 19. &c.*

3. Because the *Pleasure* of *Wine*, and the *Venerable Act*, manifestly loosens all the *Limbs*, as *Sleep* does.

4. Because, that in those *Pleasures*, as also upon the sight of a Beloved Mistress, &c. the *Eyes* look *deadish*, by reason of the Laxity of the *Cornea*, and that the *Pupilla* is dilated.

5. The Skin (as has been intimated) looks *Florid*, which made the *Ancients* say, That the Blood and Spirits came outward to meet the good and agreeable Things.

6. Because all *Pleasure* that is consistent with lying or sitting still in a silent quiet manner, inclines us to sleep, as *Musick*, pleasant *Frication* of the *Head*, *Back*, or any itching Part, sweet and acceptable *Odours*, a Thing of very acceptable taste held in the *Mouth*, *Wine*, *Meats*, *Venus*, the pleasant sound of the fall of *Waters*, *Whistling Winds*, *Rocking*, *Undulating* in *Hammocks*, &c.

7. Because in *Coiton* it relaxes the Neck of the *Womb* to admit the *Animal Elixir Vitæ*; of which we have most evident *Proof*, and some *eminent Instances*, that I forbear the Relation of out of *Modesty*.

8. *Pleasure* causes a large and wide *Pulse*, as *Relaxation* always does.

9. A Loss or great Diminution of Sensation, as in the *Venereal Aë*, (which if it were of continuance, would exactly imitate *Opium* in its Effects) upon *Drinking Wine*, &c. the Effects of which being of greater *duration*, and by taking somewhat into the *Stomach*, (as *Opium* is) are very like that of *Opium*.

10. *Intense Pleasure*, *Joy*, &c. do frequently cause *Ecstasies*, *Syncopes*, *Leipothymies*, which are only great *Relaxations* (as has been shewn.)

11. You see that the *Pleasure* of *Wine* causes *Faltring* of the *Tongue*, which is the Effect of *Relaxation*, as in *Sleep*, *Palsies*, &c. and relaxes the whole *Body*.

12. *Wine*

12. Wine also prevents Lassitude, (as all pleasant *Diversions* do) and causes all the *Eff. As* of Relaxation, as taking away Pain, causing a Deadness of the Eyes, Dilatation of the Pupilla, Floridity of the Skin, Perspiration, Diminution of Sensation, Mirth, good Humour, Sleep, &c.

Note, That Pleasure being generally from External Objects, and also short, slight, and transitory, is the true Reason of the great Penury of Things that bear any compleat Analogy to Opium in its great Effects, which made it seem more amazing, and confound People; whereas all the Difference is nothing but its causing an internal, intense, and permanent Pleasure: All Pleasures have the same *Eff. As*, but that they are short, slight, fading, external, inconsiderable, intermitting, interrupted by some grievous Objects, Thoughts, Passions, as Fear, Care, Solitude, Melancholy, &c. but the Pleasure of Opium we carry within us continually, whether we will or no, waking and sleeping, without any intermission or interruption, and that in a high degree for many hours.

Doubtless that of Venus, if it were half as lasting, would be as dangerous as that of a great Dose of Opium, or Wine drank in a vast Quantity, which is in a manner as dangerous as Opium, and for the same Reason, viz. by overdosing, a great Relaxer by the Pleasure it causes.

The Causes why the Pleasure of the Venereal Act, as a large Dose of Wine, Opium, &c. take away Pain, are;

1. Because the Sensitive Soul cannot attend to Two Things at once; therefore when a Sense of Pleasure is introduced, there cannot be at the same time a Sense of Pain, which tho' not noted in short, transient, and desultory Pleasures, (as almost all are besides that of Wine and Opium) yet the more permanent do exact our Notice and At-

rention, because they exclude Pain for so considerable a time that they amaze us.

2. Because the *Sensitive Soul* attends more willingly to *Pleasure* than to *Pain*, so that *Pleasure* engrosses his *Attention* (as was intimated.)

3. Because *Pleasure* and *Pain* (or *Displeasure*) are Contraries, and cannot co-exist in the same Subject (or *Sensitive Soul*;) therefore when *Pleasure* affects it, *Pain* cannot.

4. Because *Relaxation* (which is the *Mechanical* and *main Reason*) gives such Liberty to the *Animal Spirits* to expand, that they become unfit for want of *Compressure*, to convey any Impressions smartly, which is requisite to cause a *sense* of *Pain*, that is caused by a smart *Impression*. To which you may add, That

5. *Pleasure* and *Relaxation*, where they continue, (as in the Case of *Wine* and *Opium*) do highly improve one another, because they mutually cause one another; for *Pleasure* causes *Relaxation*, and *Relaxation*, as you find in a sweet *Slumber*, &c. *Pleasure*; so that permanent *Pleasure* must highly advance *Relaxation*, which takes away *Pain* by preventing all smartness of *Impression* by the now yielding Nature of the expanded *Animal Spirits*, which are, as *Air* in a Gut half full, or a Rowl of Carded Cotton or *Wooll*, fit only to carry a gentle or no *Impression* to the farther End thereof.

So that upon the giving of *Opium* when the *Pain* does once begin to diminish, it is not long afterward before it goes quite off; for if the *Pleasure* does but take off one in ten of the *Pain*, it is a sign; that it will be an easie matter for it (that is, upon the Improvement for the Reasons aforesaid) to overcome one in nine, and yet much easier to overcome one in eight, and so on; Therefore it is a certain sign, that you have given enough to take away

away the *Pain*, if it once sensibly decreases ; and consequently all *Physicians* should then not give any more *Opium*, tho' the *Pain* is not yet quite off: For if the *Relaxation*, caused by *Pleasant Sensation*, was of force enough to overcome the greater *Contraction* by the greater *Pain*, which opposed it more strongly, it will suffice to overcome the less. This intimates, (and 'tis Experienc'd) that *Doses* must be proportioned to the *Pain* ; for tho' a few *Glasses* of *Wine* may take off the sense of a small *Pain*, more must be drank to take off a greater ; and so of *Opium*, because the *Contraction* by *Pain* resists the *Relaxation* by *Pleasure*.

Having shewn how *Sleep* and *Pleasure* take away *Pain* by *Relaxation*, permitting the *Animal Spirits* to expand, and grow unfit to carry *Impressions* smartly, and that therefore *Sleep* stops or moderates all *Fluxes* that depend upon *Irritation* of the *sensible Parts* to cause them to Contract and squeeze out the *Humours* that cause the *Flux*, while the same *Relaxation* opens the *Pores*, and so lets out the *Fumes* of the Body, which only (like *Smoke* in a *Chimney*) require an open *Passage* by reason of their *Levity* which carries them off ; it plainly appears how *Pleasure*, that takes away the sense of *Pain* or *Irritations* by the like *Relaxation*, must stop the first sort of *Fluxes*, that require the *Irritations* to contract the *Parts*, and promote that of *Perspiration*, (as in *Sleep*) which requires only the opening of the *Pores* ; so that I need add no more *Words* about it, for the same *Cause* must have the same *Effect*, therefore an *intense* and *permanent Pleasure* must have all, or much of the *Effects* of *Sleep* in general (as has been shewn :) It cannot therefore be any Wonder that *Opium* causes *Sleep*. Yet is there *Difference* between *Sleep* and *Pleasure* upon other Accounts, tho' not

not upon the Account of *Relaxation*, viz. because;

I. That *Sleep* requires also a rest of *Spirits*, (or the *sensitive Soul*) whereas *Relaxation* by *Pleasure* is consistent with motion of the *Spirits*, either by outward *Action*, or internal motion thereof, by some inward *Causes*. Hence it is;

First, That we can *Labour*, *Travel*, *Dance*, &c. and enjoy *Pleasure* and its *Relaxation*: *Voluntary motion*, which requires only a particular *Contraction* of some Parts by the *Dictates* of the *Will* or *Appetite*, being consistent with the general *Relaxation* by *Reason* of the *Prerogative* of the *Will*. Thus do we move, tho' more relaxed, or when most Merry and pleased with *Wine*; nay, some will walk in their *Sleep*, (when extremely intent upon a Thing) as when awake; which shews the ruling *Power* of *intensive Contraction*, that may be exercised with *Relaxations* and other *Contractions* as the *Will* it self may, or *intensive Appetite*.

Secondly, That *Pain* is often taken away by *Opium* by the *Diversion* and *Relaxation* caused by *Pleasure*, and its *Inconsistence* with *Pain*, without *Sleep*, which requires the aforesaid *Rest*; That bare *Relaxation*, as such, does not include, tho' *Relaxation* suffices to take away *Pain*.

Thirdly, That *Opium* does by its *Heat*, *active Particles*, &c. hinder some Persons to *Sleep*, yet have you in both these last Cases all other *Effects* of *Opium*, as *Pleasure*, *Indolence*, *Relaxations*, &c. which shews how far *Sleep* is from being a constant, and the most genuine *Effect* of *Opium*, as is generally imagined; however we must allow it (as has been shewn) to be a mighty *Disposer* of us towards *Sleep*, because of the *Relaxation* that it causes, which is the main *Requisite* of *Sleep*.

II. That

II. That *Pleasure* does, without *Nutritive Re-fection*, by the Complacency it causes in the *sensitive Soul*, produce *Comfort*, *Satisfaction*, *Composure*, *Elevation of the Spirits*, *Euphory*, &c. of which *Sleep* is either not at all capable, or but in a *low degree*, proportionable to the *sensation* that it has, which is but little; however a *Pleasure* that remains within us, even in our *Sleep*, as that of *Opium*, may well cause *Pleasant Dreams*, &c.

The Reader may observe, that in all Places, where I mention, that *Relaxation* causes the opening of the *Pores*, that I speak only of *Perspiration*, as the *Effect* thereof, without mentioning *Sweat*.

1. Because *Perspiration* is the only *constant* and *infallible Effect* thereof, by reason that the *Levity* of the *Fumes* causes them as certainly to pass at the *Pores* when open, as *Smoke* passes up at an open *Chimney*.

2. Because *Sweat* is an *uncertain Effect* thereof, for it requires that the *Body* be well fill'd with moisture, tho' there is a *Relaxation* or *Opening* of the *Pores*; as *Hippocrates* very rightly intimates in that *Aphorism* of his that I cited in the last Chapter. 1. Because *Sweat* has not that *Levity* that the *Fumes* have, to cause it readily to move as soon as the *Pores* are open. 2. Because *Relaxation* is more apt to receive, detain, and suspend *Humours*. 3. Because the protrusive Motion of the *Heart* is weaker in all *Relaxations*; and all see how much its *Vigorous Protrusion* contributes to *Sweat* upon *Action*. 4. Because a *Heartfull* of *Bloud* does not make such a *Push* forward when the *Arteries* are widen'd by *Relaxation*. 5. *Sweat* having more of *Continuity*, *Consistence*, and *Viscidit*y, cannot flow out so readily at the *Pores*, as

a meer Vapour. However, if the *Body* be full of *Moisture*, and the *Pores* open, there being a Natural Course that *Way*, and the *Heart* continually protruding it farther and farther, a *Sweat* follows, and that whether they Sleep or not.

3. Because *Sweat* (as was in some sort intimated) is sometimes caused by the *strong Protrusion* of the *Heart*, as in *Motion*, &c. and upon that *Account* comes more under the *Title* of *Fluxes* caused by *Contraction*, than *Relaxation*, of which *Perspiration* is a constant Effect.

4. Because *Sweat* is sometimes caused by another sort of *Contraction*, viz. the *Compression* of the whole *Body* by a violent *Defensive Contraction*, as in great *Terrour*, *Agonies*, and the like; causing thereby (as was shewn) by the Comparison of a wet Sheet wrung, (whose out side is cold) a cold *Sweat*, which that of *Alum* or *Vitriol*, causing an *Exudation* of the *Spittle* into the *Mouth* by constringing the *Parts*, does illustrate very plainly.

Therefore you see I had just Cause not to mention *Sweat* as a certain and proper *Effect* of *Relaxation*, without good *Distinctions* first made; tho' unwary *Authors* that talk any Thing one after another, not knowing what they say, make it their common saying, That *Sleep* and *Opium* stops all *Fluxes* but *Sweat*, whereas they should have rather said, but *Perspiration*; for *Opium* and *Sleep* also will sometimes hinder *Sweat*, viz. that from *Pain*, *Terrour*, &c. and that as happens just upon awaking by the stronger *Systole* of the *Heart*, and *Contraction* of the whole *Body*, and that also upon motion, unless the *Body* be (as was said) full of *Humours*, or *Moisture*. Therefore it is a *Vulgar Error* to say *Sweat* instead of *Perspiration* in the Case aforesaid.

You

You may remember, that in the *Beginning* of this Chapter I concluded, that a *Sal-Volatile-Oleosum*, such as *Semen Humanum*, wherein the *Oily* and *Volatile Parts* are strictly combined, and the *Volatile* somewhat more *active* (or *acrimonious*) than that in our *Membranes* in general, must be most pleasing to the *Membranes* by a fine *Titillation*, &c. therefore if *Opium* should prove to be such, we need not wonder at its titillating to *Venery*, nor indeed its causing a *high* sense of *Pleasure* upon any *Membrane*, (they being all of the same *Nature*) but especially upon the most exquisitely disposed *Membrane* of the *Stomach*, and the *Venerial Parts*, nor consequently its causing all the aforementioned *Effects* of *intense Pleasure*, as *Comfort*, *Satisfaction*, *Ovation*, &c. of the sensitive *Soul*, (or *Spirits*) and *Relaxation* of all the *sensible Parts*; which will easily solve all the *Phenomenas* of *Opium*, however numerous, mysterious, and seemingly contradictory, as you'll find.

Let us therefore now see, whether *Opium* be such a *Sal-Volatile-Oleosum*, wherein the *Volatile Particles* are somewhat more *active* or *acrimonious* than ours; and the *Oily* and *Volatile Parts* strictly combined? If so, the *Business* is done, the *Nail* is hit on the *Head*, and I may say *Eupera*.

C H A P. XV.

Shews what are the Principles of Opium, and which cause the good and bad Effects thereof.

HAVING tried (if not tired) your Patience, and premised what I thought necessary in the foregoing Chapters, I now reassume the Thread of my Discourse.

As for the *passive Principles* of Opium, which do or signifie little or nothing, we need not be solicitous, only tell you that it has much of *Earth* and *Water* in it, and more or less of *that* according to its *Foulness*, and of *this* according to its *Moistness* or *Driness*; and that it always has more *Water* in it in *moist Weather*, for I never knew any Thing so apt to take in moisture, and to alter accordingly in its *substance*, (tho' not in *virtue*) in so much, that I have used it as an *Indicator* of the *Weather*, and it never fails to shew the *degree* of *moisture* in the *Air*, if it be kept in a convenient Place, where Accidents, as the *Sun*, *Fire*, &c. may not alter the Case, and always in the same Place.

Our Business therefore being to enquire after the *active Principles* of Opium, I shall proceed in this Plain and Natural Method, *v. z.* I shall Enquire;

1. Which are the predominant *active Principles* of Opium? And how combined, &c.

2. Which

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2. Which of them produce the good and laudable Effects of Opium? And why?

3. Which of them produce its ill Effects? And why?

I. As to its active Principles which are predominant.

First, It manifestly appears, That Opium is highly impregnated with Volatile Salt.

1. By its biting, and pungent Taste, which is the certain Effect of Volatile Salt; as in Mustard, Horse-Radish, Cresses, Arum, (or Wake Robin) Scurvigrass, Rocket, Spearwort, Crowsfoot, Squills, Radish, Arsmart, Onions, Garlick, and very many Plants of the same Kind, which have their biting and pungent Taste (as all know and allow) from their Volatile Salt; and so have all Plants of the like Taste, which are therefore commonly esteem'd to be Antiscorbuticks.

2. By its rank and vehement Smell, being such, as is by the common Consent of the Learned always attributed to Volatile Salt alone, or join'd with some Oily Parts, as the smell of Semen Virile, (to which I take that of Opium to be most like) of burnt Hoofs, Horns, Skins, Membranes, &c. Garlick, Onions, Rocket, Pismire, Soot, &c.

3. By its ready Dissolution in Water, moist Air, &c. which must be from its Volatile Salt, because it has very little Fixed Salt, and because Volatile Salt is the most dissolvable Salt that is in Vegetables before they have passed the Fire.

4. By its Dissolution in Spirit of Wine, which Volatile Salts are more apt to do than Fixed Salts; and this is one Reason why it is so apt to dissolve in all Menstruums, especially the Three main ones,

ones, viz: The Watery, the Salino-Volatile, (as Spirit of Salt Ammoniac, Spirit of Harts-Horn; &c.) and the Spirituo-Sulphureous, as Spirit of Wine, Brandy, &c. in which last Things its Sulphur that is join'd with the Volatile Salt, doth much help it to dissolve.

5. By its *inciding* and *discussing* Quality, when externally applied; which Qualities must be attributed to its Volatile Salt, it having no other Principle that can cause those Qualities, especially in that eminent degree as Opium has them, and seeing it is not a Thing that has undergone Fermentation, as Vinous Spirits, and that it has but one in 32 of the Fixed Salt in its Mass, as the most Excellent Dr. Crew proves.

6. By its *resolving* Quality, being externally applied; for Resolution is caused by such Parts as easily penetrate and mix with our Skin, Flesh, &c. and such as do so must be of like active Principles with our Parts; for all know, that easiness of mixture is by likeness of Parts, and the active Principles of our Skin, Flesh, &c. are Volatile Salt, join'd with some Oily Particles, (as has been said;) Therefore Opium must have such Principles to be so great a Resolver. Hence it is, That Gum Ammoniacum, Hemlock, and several Gums, Plants, &c. that are saturated with Volatile Salts, are such good Resolvers; but it is worth a very particular Remark, That all Narcotick Plants are very eminent, yea, the very best Resolvers of hard Tumors, and the like, as Solanum lethale, (or deadly Nightshade) Hemlock, Henbane, Mandrake; and the more Narcotick they are, the more Resolving.

7. By its *exulcerating* or *blistering* Quality, (which is but a stronger sort of Resolution of Parts;) which the best and strongest Opium that is gathered by Drops out of the Incisions of the Poppies Heads, (as Author's testifie) and the best

we have (as some say) will do, upon very tender *Skins*, or at least rubify, as *Mustard*, &c. will; which most evidently proves its *Volatile Salt*; for all *Blisterers*, as *Cantharides*, *Pismire*, *Crowfoot*, *Spearwort*, *Garlick*, &c. do it upon the Account of their *Volatile Salt*, unless it be *Lexivials* which have passed the Fire, which *Opium* has not.

8. Its offending the Eyes, as *Onions*, *Mustard*, &c. do, when it is applied thereto, argues its *Volatile Salt*.

Note, That the very best *Opium*, as the *Turks*, *Mastach*, &c. does cause this Effect most of all, which manifestly proves, that the *Vertue* of *Opium* does mainly depend upon *Volatile Salt*, which is most certainly the Cause of that Effect of exulcerating, (or blistering) as all do allow in Things that have not passed the Fire.

9. Its *Psilothrick Quality* proves the same, for it causes the *Hair* to fall by the same Principles.

10. Its eminent *Titillation* to *Venery*, as *Cantharides*, *Bees*, *Pismire*, *Sem. Virile*, *Garlick*, *Onions*, *Leeks*, *Horse Radish*, *Mustard*, *Rocket*, *Basil*, *Oysters*, *Bears Garlick*, *Crows Garlick*, &c. do most infallibly argue the Abundance of its *Volatile Salt*, by which those Things, and all other Plants that have much *Volatile Salt*, excite to *Venery*.

11. Its Aptitude to evaporate and flie away, argues its *Volatility*.

12. Its causing a *Tickling*, and *Itching* in the *Skin*, does most directly prove the same; nor does any Thing that is taken inwardly cause it more: It must have a very *Tuillating Volatile Salt*, that will, in so small a Quantity as *Opium* is usually taken, cause such violent *Itchings* (as it does) in the *Skin*, after it has passed all *Digestions* and *Concoctions*.

13. Its *Bitterness* proves the same : For the *Curious* and most *Perspicacious* Dr. *Grew* says, That *Bitterness* proceeds from *Sulphur* well impregnated with *alcaline* or *acid Salt* shackled with *Earth*; but it is certain, that it is not an *acid* in *Opium*, for the many *Reasons* given, and to be added. He also says, That when *Sulphur* and the *Alcaline* are more equal, they produce a *tawny* colour; and *Opium* rudely torn is *tawny*, till the *Air* alters it. All which *Sylvius* confirms, where he says, *Pran. Med. L. II. Cap. XXVI. 80. Omnia amara volatili sale abundant, ad quod constituendum oleum quoque concurrit, sive Sulphur.* That is, All bitter Things abound with *Volatile Salt*, to constitute which *Oil* (or *Sulphur*) concurs. I cannot chuse (tho' I do not much depend upon *Authority* in the general) but value the *Affertions* of such Men, by way of *Concurrence* at least.

14. The *Acrimonious Sweats* that it causes, proves the same.

15. It is also *Diuretick*, as, and after the same manner with *Cantharides*, *Bees*, *Pismire*, *Millepedes*, *Scurvygrass*, *Horse Radish*, &c. that is, by *Titillation* upon the *Account* of the *Volatile Salt*, which appears by its exciting to *Venery* at the same time, as all those *Volatiles* do.

16. Its causing *Vomitings* (as it often does) is an undoubted sign of its *Volatile Salt*; for all *Vegetable Vomits* are such upon that *Account*, unless it be such as may move *Vomiting* meerly by their being loathed, or nauseated, which only cause some particular Persons to *Vomit*; but such as are *constant Vomitories* are so upon the *Account* of their *Volatile salt*, as *Ascerabocea*, *Groundsil*, *Fox-loves*, *Squills*, &c. given in a sufficient *Quantity*.

17. Its lively *Effects*, as *Courage*, &c. prove the same.

18. All

18. All *Authors* that have been Curious, do agree, that *Opium* abounds with *Volatile Salt*, as *Helmont*, *Lemery*, *Le Febvre*, *Wedelius*, and indeed every one that ever I read, tho' most of them attribute its Effects to a *Sulphur*, which makes their *Testimony* of its *Volatile Salt* the stronger, as being forced to confess it against their *Hypotheses*.

19. After its *Fermentation* with Leaven in a Sand Heat for 14 days, it affords a *Volatile Salt* in good Quantity, but mixt with Oil, which is separated from it by Dissolution in Water, Filtring, &c.

20. Its Spirit ferments with Acids, therefore is *Volatile*.

Lastly, (to Pin up all) if you either *Chymically* Analyse it by Fire, or set it to Crystallize, after it is evaporated to a due Condition so to do, it affords a great Quantity of *Volatile Salt*.

Therefore it is past all manner of doubt, (for which End I have the longer, and more particularly insisted upon this Point) that it is highly impregnated with *Volatile Salt*: But, as I said in the last Chapter, it is not enough for it to have *Volatile Salt*, but it must be such as exceeds our own, or other Animals in Activity, Briskness, &c. by Reason of Quantity or Quality, or both, that it may tickle up, excite, and cause a fine and agreeable Ovation, or glowing in our Spirits, which (as was shewn) is very pleasant, (as in the Case of *Sem. Viril.*) especially when agitated by Warmth, Frictions, or such Actuating Causes.

Secondly, It manifestly appears, That the *Volatile Salt* of *Opium* exceeds ours in Activity, Briskness, &c.

1. By its *exulcerating* (or blistering) *Quality*, especially if it be very good *Opium*.
2. By its *Psilotrick Quality*, to cause the Hair to shed.
3. By its *irritating to Venery* in so eminent a Degree, as *Cantharides*, *Bees*, *Pismire*, &c. do, and even beyond the ordinary Course of *Sem. Virile*, which is most saturated with *Volatile Salt* of any Part of the *Animal*, as appears by its Dissolution (like *Opium*) in *Watery Menstruums*; its rank smell, its *titillating to Venery*, its *Weight*, &c. which is much the same with that of *Opium*, both sinking in *Water*, &c.
4. By its great *Irritations to make Water*, like *Cantharides*, *Bees*, *Pismire*, *Millepedes*, &c. when it is taken in a good Quantity, or often.
5. By its causing *Vomitings* in a very severe manner, which it would not do without a very *poinant Volatile Salt*.
6. By its causing such violent *Itchings* in the *Skin* (especially if taken in any Quantity) after it has past all *Digestions* and *Concoctions*. And,
7. By its causing *acrimonious Sweats*, after it has past those *Digestions* and *Concoctions*.
8. By its causing a very pleasant Sensation at *Stomach*, far above any *Flesh*, *Fellies*, or any *Animal Nutriment*.
9. By its offending the *Eyes* so much by its *Acrimony*, as *Mustard*, *Onions*, *Horse Radish*, &c. do.
10. By its very *pungent* and *acrimonious Taste* above all *Flesh* or *Fish*.
11. By its very rank and vehement Scent, equal to, if not exceeding that of *Semen Virile*.
12. By its *Chymical Analysis*, whereby it affords a very *acrimonious Volatile Salt* in great plenty, which *Helmont*, *Wedelius*, and others, do confirm.

There-

Therefore it is also past doubt, That the *Volatile Salt* of *Opium* is more *active*, *acrimonious*, and *tillating*, than those in our *Membranes*, or in *Sem. Virile* it self. But seeing it is not *Volatile Salt* alone, (as was shewn) which agrees only with one of the *active Principles* of our *Membranes*, (and may be, and is of it self too *acrimonious* and *rude* for the *Membranes*, without its being sweetned up, and smooth'd into a more gentle and pleasing *Agreeableness* by *Oily Parts*) we must see, whether it is not also *Oily*, (or *Sulphureous*) and consequently a *Sal. Volatile. Oleosum*, agreeing in both the *active Principles* of our *Membranes*, that it may thereby be the more delectable, gentle, and agreeable.

Thirdly, It is very obvious and evident,
That *Opium* is *Sulphureous*.

1. Because the Juice of the *Poppy*, whereof it is made, is of it self, when it drops out of the *Incisions*, *Milk-white*, which colour in Liquids (especially the Juice of Plants) proceeds from *Sulphureous Particles* mixt with *Water* (or *Pblegm*) as *Milk*, *Emulsions*, *Chyle*, *Cinnamon Water*, and the *Tinctures* of all *Sulphureous Things* dropt into *Water*, do evince.

2. Because it is *inflammable*; for nothing is so but what is *Sulphureous*.

3. Because *Opium* will soften with a *dry Warmth*, which all, and only, *Sulphureous Things* will do; as all *Rosins*, *Tallows*, *Pitches*, *Tarperntines*, *Oils*, and such *Sulphureous Things*.

4. Because it is very *bitter*, and that *Oleose Particles* are always (as *Dr. Grew* and *Sylvius* truly say) one *Ingredient* of a *bitter Taste*.

5. Its *tawny colour* does also (as was said according to *Dr. Grew*) argue much *Sulphur*.

6. Its hot Taste proves the same; for a proper hot Taste is from Sulphur, as the biting or pungent is from Volatile Salt.

7. Because of its pungent and strong Smell, which denotes Sulphur.

8. Its being so dissolvable as it is in Spirit of Wine, Brandy, and other Sulphureous Menstruums, proves the same.

9. Its dissolving Quality argues, that it has the same Principles with our Skin and Flesh, which are Oleose as well as Salino-volatile, and that nothing is a compleat Dissolver, but such as have both; because Agreeableness in Principles being the Basis of Dissolution, (as you see in Menstruums, and the Things therein dissolv'd) there is no good, kind, or compleat Dissolvent of our Flesh, &c. but what participates of both; because otherwise there would be a Disagreement in one Respect.

10. It appears by Autopsie upon the Chymical Analysis of Opium, &c. that it has a very considerable Quantity of Sulphur.

11. So if you only dissolve it in Water, you'll find much Sulphureous Substance undissolved at the bottom.

12. All (or most) of the Modern Authors attribute its Operation to Sulphur, agreeing, that it is well impregnated therewith.

Therefore Opium consists very much, as to its active Principles, of a Sal-Volatile-Sulphureum; but still this does not compleat a most agreeable Sal-Volatile-Oleosum; 1. Because it may be a Sal-Volatile-Resinosum, and yet be a Sal-Volatile-Sulphureum. 2. If it be a Sal-Volatile-Oleosum, the Oil and the Volatile Salt may be so disjoin'd, as not to conspire and co-operate to please the Membranes, but act separately, as Oil and Volatile Salt given out of divers Spoons, and cause no more Effect

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Effect than Oil of Olives and Spirit of Sal Ammoniac taken inwardly, one acting too softly, lazily, and greasily, to cause any brisk and agreeable Ovation of the Spirits, and the other too rudely stinging the Membranes; therefore we must proceed in our Enquiry.

Fourthly, Opium has a sort of Resinous Sulphur, that is loose, and not united with the Volatile Salt; which plainly appears;

1. Because, if you dissolve Opium in Water, cold or hot, or any Watery Menstruum, you'll find a good quantity of Resin undissolved at bottom, while the Volatile Salt is all or most dissolved in the Water, (especially if the Water be often repeated) and quite separated from the Resinous Part which subsides, without any more trouble; which shews, that the Volatile Salt and it are not combined, but in a very loose and distinct manner.

2. Because, if you first dissolve Opium in Spirit of Wine, which imbibes the Resin, it is easily again precipitated by plain Water, leaving behind it all or most of the Volatile Salt in the Form of a red Tincture in the Menstruum, as it does also in the former Case.

Note, That the Resinous Part of Opium has no Effect as an Opiate, for if it be well washed with Water (as was said) it has no Operation of that kind, or so little, that it is not worth the minding, but all the Vertue, Specifick Taste, Smell, &c. is carried away in that red Tincture, which has all the good Effects of Opium, as Experience assures us.

3. Because, if *Opium* be very much torrefied, most of the *Volatile Salt* is evaporated, and with it most, if not all, the *Vertue* of *Opium*; but the *Rosin* remains as a deadish Stuff in Respect of the good Effects of *Opium*, tho' it is (as shall be proved) the Producer of the ill Effects thereof. Therefore this *Rosin* must be wholly rejected.

Fifthly, The Red Tincture aforesaid has all, or most of the *Volatile Salt* in it.

1. Because *Water* is the Proper Menstruum for Saline Things, and that the Tincture reduced to an Extract gives very much in moist Weather; which Quality it must have from the *Volatile Salt*, because it has very little Fixed Salt.

2. Because the Specifick Bitterness which proceeds from *Volatile salt*, and Oily Parts, is wholly in that Red Tincture.

3. Because that Tincture has also the Specifick Rankness of Smell that the *Volatile Salt* (as was shewn) gives the *Opium*, by the Help of some Oily Parts.

4. Because that Tincture, reduced to an Extract, has the biting Taste of *Opium*, which (as was shewn) proceeds from its *Volatile Salt*.

5. Because that Extract incides, discusses, resolves, is Psilotrick, titillates to Venery, causes Itchings in the Skin, acrimonious Sweats, &c. all which are (as was shewn) the Effects of *Volatile Salt*.

But what need I insist so much upon its Effects to prove it? When,

6. It appears by Crystalization of the said Tincture, after it has been evaporated to a due degree, that it contains the *Volatile Salt* in it, which in a cool Place shoots to elegant Crystals; and that,

7. It

7. It is found therein by Chymical Operation by Fire.

Sixthly, The said Tincture is Oleose.

1. Because the Redness of the Tincture must be from *Oily Parts*; for pure sincere *Volatile Salt* gives no such Tincture.

2. Because it is *bitter*, one Ingredient of which Taste is ever *Oily Parts* (as was said.)

3. Because of its *rank smell* like *Sem. Viril.* which proves it to be *Sulphureous*; for the *Volatile Salt* alone has only a quick smell, or *Urinous* at farthest.

4. Because it is of a *Hot Taste* when reduced to an *Extract*, which *Heat of Taste* considered distinctly from its pungent, or biting Taste, must be from *Sulphureous* or *Oily Parts*.

5. Because *Spirit of Wine*, and other *Spirituo-sulphureous Menstruums*, do readily dissolve it when reduced to an *Extract*.

6. Because the *Extract* softens with dry warmth, as *Sulphureous* or *Oily Things* do.

7. Because a true *Sal-Volatile-Oleosum*, wherein the *Volatile Salt* and *Oily Parts* are intimately combined, (as you find in all *Blonds, Tinctures* of several *Plants* that have such a *Sal-Volatile Oleosum*) is red.

8. Because it could not otherwise so finely please the *Membranes*, cause *Sleep*, compose the *Spirits*, &c. if it were all *Volatile Salt*, which is wholly pungent and acrimonious, mightily opposes *Sleep*, and causes a great stir in the *Bloud* and *Spirits*.

But, (as I said as to its *Volatile salt*) what need I insist upon its *Effects*? When,

10. Its *Inflammability* (after it is reduced to an Extract and dried) puts it out of all Question; And that,

11. An Oil may be separated from the *Volatile Salt*, tho' not without Trouble, because that, (as is requisite to compleat it in the highest degree)

Seventhly, The *Oily Parts*, and *Volatile Salt*, are very intimately, and strictly combin'd, as fairly appears,

1. By the *Difficulty* to separate them.
2. By the *Redness* of the *Tincture*, (as in *Bloud*, &c.) for when *Oily* (or *Sulphureous*) *Particles* are loose therein, they make either a *white Colour*, as the *Rosin* does in the Drops that fall out of the Incisions in the Heads of the *Poppies*, which are *Milk white*; or leave the *Volatile Spirit* perspicuous, as in a sort of artificial *Sal. Volatile-Oleosum* that is sold at the *Apothecaries Shops* in *London*.
3. Because it imparts its *Tincture*, which depends upon both, to all *Menstruums*.
4. Because it imparts its *Vertue*, which depends upon both, to all *Menstruums*.
5. Because it imparts its *Specifick Smell*, which depends upon both, to all *Menstruums*.
6. Because it imparts its *Specifick*, *hot*, and *biting Taste*, which depend upon both the *Oily* and *Volatile Particles*, to all *Menstruums*.
7. Because it will hold its *Vertue* many years, which it could not, if the *Volatile Salt* and *Oily Parts* were not very strictly combined.
8. Because, that notwithstanding the *Digestion* at *Stomach*, it has held its *Specifick Vertue*, *Smell* and *Taste*, after it has been in it 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, or more *Hours*, as appear'd by its Operating so long, and afterward its being Vomited up with the same *Taste* and *Smell* that it had

had at first; than which there cannot be a greater Argument.

9. Because it has been carried off by Stools, which had its *Specifick Smell* after many *Hours* remaining in the *Stomach*.

10. Because its Operation in general lasts long. *Charas* mentions one that it Operated with for about 30 *Hours*; and *Wedelius* another, whom *Opium* caused to Vomit constantly about 18 *Hours* after it was taken.

11. Because it has its *Effects* upon the *Venereal Membranes* after it has passed the *Digestion* at *Stomach*, the Effects of the *Choler*, and *Succus Pancreatus* in the *Duodenum*, been strained through the Coats of the *Intestines* into the *Lactals*, and through the *Glandules* of the *Mesentery*, mixed and circulated with the *Bloud*, &c.

12. Because, after all that, it has its *Effect* upon the *Skin*, by causing an *Itching* therein.

13. Because it not only causes *Acrimonious Sweats*, but such as evidently smell thereof, which argues, That the *Specifick Combination* of the *Oily* and *Volatile Parts* baffles all *Coctions*, *Digestions*, *Circulations*, and *Percolations*, that have happened in the *Body*. *Dioscorides* and *Aegineta*, speaking of *Opium*, say, ὁσμήν τὴν φαρμακίαν δι' ὅλης τῆς σωματικῆς διέσσης, that is, *The smell of the Medicament is expanded over the whole Body*. Which Things of its Nature do, as *Garlick*, *Onions*, *Semen Animale*, which causes *Rankness* all over *Male Creatures*, as *Rams*, *Boars*, *Bulls*, &c.

14. *Le Febure*, in his *Chymistry*, Part 2. p. 33. says, That *Opium* has a *Volatile Salt* inseparably mixt with *Sulphur* (or *Oily Parts*.)

15. *Wedelius*, in his *Opiologia*, Lib. 2. Sect. 1. Cap. 4. P. 91. speaking of *Opium*, says, *Sal ejus cum sulphure intime combinatum sudores efficit*, that is, *Its salt being intimately combined with sulphur, (or Oil)*

Oil) causes Sweat. And, Lib. 2. P. 143. *Kedonv obtinuit non facile dissipabilem*, that is, It has a con-texture not easily dissipable.

18. All know how apt *Volatile Salt* and *Oily Parts* are to combine ; Therefore

Opium acts and produces its usual good Effects by a *Sal-Volatile-Oleosum*, somewhat more active than that in our *Membranes*, whose Principles are most intimately and strictly combined, and so that it is qualified in the highest degree for our Purpose ; Because,

1. It agrees in Principles with our *Membranes*.

2. That its *Sal-Volatile-Oleosum* is more active and vigorous than that of the *Membranes*, to actuate and excite the *Spiritus insiti*, and finely to tickle and gratifie the *Membranes*.

3. That the *Volatile Salt* and *Oily Parts* being so intimately combined, do deliciously qualifie one the other for that Purpose ; While the *Oily* smooths and lenifies the *Volatile Salt*, and the *Volatile Salt* actuates and quickens the *Oily* ; And that being so combined,

4. Both conspire to a permanent and exalted Pleasure of the *Membranes*, especially at *Stomach*, and the *Venereal Parts*, where they are so exquisitely disposed for Sensation.

Therefore the *Sal-Volatile-Oleosum* of *Opium*, separated from its *Rosin*, is most consummate, and best qualified, that possibly can be imagined, to please, gratifie, and finely to titillate our *Membranes*, or *Organs of Sensation* ; which was the Thing required.

I can.

I cannot better illustrate its Nature, than by the most exalted Thing in an Animal, viz. its *Semen*: Therefore for Confirmation of its *Principles*, and *Excellency* therein, I will consider its *Likeness* and *Agreement* therewith ;

1. In being both a *Sal Volatile-Oleosum*.
2. In having a more active, vigorous, and exalted *Sal.Volatile-Oleosum*, than any Part of the *Animal*.
3. In having the *Volatile Salt* and *Oleous Particles* intimately combined, for *Semen Animale* will (as *Opium*) keep very long uncorrupted, as appears by its long stay in the *Vesiculæ seminales* of some *Animals*, that do not excrete it in many years.
4. In that both are apt to mix with all sorts of *Menstruums*, and both *Mole minima, Virtute maxima*.
5. In having much the same Smell, viz. a rank and vehement one.
6. In tainting the Body therewith (as has been shewn.)
7. In being much of the same *Weight*, as appears by both sinking in *Water, &c.*
8. The *Taste* must (in all Probability) have a Rankness in it like that of *Opium*, because it gives a rank *Taste* to the whole Body of *Male Creatures*.
9. Both excite *Venery*, cause *Erections*, *Veneral Fury*, and *Nocturnal Pollutions, &c.*
10. Both cause *Boldness*, *Courage*, and *Magnanimity*, which are reckon'd among the *Effects* of *Opium*, and are the common *Effects* of *Plenitude* of *Seed* in *Animals* (that are otherwise *pusillanimous*) in *Times* of *Copulation* ; so Modest and Sheepish Boys grow much more assured, bold, and (as they commonly call it) *Manlike*, upon *Puberty* ; and Girls grow more *Womanlike* in their *Dispositions* ;
and

and 'tis my *Observation*, That the *Men* who breed most of the *Sem. Virile*, are generally, if not always, the most *Valiant*.

11. Both do cause a great *Relaxation* upon the *Pleasure* thereof, as appears after a good *Dose* of *Opium*, and upon *Emission* of the other; by the *Deadness* of the *Eyes*, (or *Laxity* of the *Cornea*) in both *Cases*, *Dilatation* of the *Pupill*, *Floridity* of the *Skin*, large *Perspiration*, *laxity* of the *Limbs*, *Sleepiness*, *loss* of *Memory* and *Sense*, *alienation* of the *Mind*, a *wide Pulse*, *Indolence*, *loss* of *Feeling* in both *Cases*, and other *Signs* of *Relaxation*.

12. Both *Opium* and *Puberty* cause a growth of the *Penis*, *Breasts*, and *increase Milk*, by *Reason* of the *Relaxation* that they cause, which (as in *Sleep*,) causes the greater *Nutrition*; but of the manner how it happens upon *Relaxation*, more hereafter, if there be occasion. Hence it is,

13. That both *Opium* and *Puberty* are apt to bring down the *Menses*, and open the *Via*, by the *Relaxation*; and that *Marriage* (or the *Pleasure* of *Venerual Acts*) do by the like *Relaxation* promote the *Menses*; That both *Opium* and such *Acts* are apt to cause *Miscarriages* by relaxing the *Neck* of the *Womb*, &c.

14. Both cause *Sadness* and *Dejection* when the *Operation* is over, as indeed *Pleasure* generally does, especially if intense.

15. Both *Opium* and *Sem. Animale* prevent *Lassitude*, and cause *Euphory*, or easier *Undergoing* of *Labour*; Hence it is, that *Stone Horses* will not be so soon tired when full thereof, and quickly recover if tired; which might doubtless be observed in other *Animals*, but that they are not used to *Labour*, and so not obvious to be observed.

16: Authors do say, That *Sem. Virile* takes of *Venereal Impotence*, procures *Love*, &c. which doubtless must be by exciting to *Venery*, as *Opium* does. Thus the *Genitals* of *Bucks*, *Boars*, *Bucks* of *Hares*, *Cocks*, &c. do (as *Opium*) excite *Venery*; and the *Seed* of *Animals*, as of a *Camel*, and the aforesaid *Creatures*, come to be esteemed *Hypnoticks*; and (doubtless) all *Animal Seed*, especially of the more *Salaceous Creatures*, is an *Opiate* in some degree.

To be short, The main (if not all) the *Difference* in their *Effects* arises only,

1. From the *Different Parts* that they affect; because *Opium* affects the *Stomach*, the *Venereal*, and all the *Membranes* in general; and *Sem. Animale* only the *Venereal Parts* immediately, tho' an intense *Pleasure* of one Part does affect the whole.

2. That *Opium* does affect with a *Sense* of *Pleasure* more permanent, viz. for many *Hours*, (as has been said) and that the *Pleasure* of the other is *Momentary*.

Therefore *Opium* acts by causing an intense, permanent, and charming *Pleasure* of the *Membranes* in general, but more particularly of the *Stomach* and *Venereal Parts*, as being more exquisitely disposed for *Sensation* for the *Preservation* of the *Individuum* and *Species*.

It cannot be much wondred at, considering our *Active Principles* are a *Sal-Volatile-Oleosum*, and that *Opium* is such, and that we naturally carry an *Opiate* within us, that in some Cases our ordinary *Sal-Volatile-Oleosum*, or that of the *Choler*, *Semen*, &c. being by some accident exalted

alted towards the Nature of Opium, may have the Effect of an Opiate upon us, by causing *Sopors*, and *Lethargick Distempers*, *Furor uterinus* by *Titillation*, &c.

Thus the Spume of some *Male Animals*, *Mummy*, &c. are reputed Opiates. *Borellus* speaks of a *Soporiferous Aura*, that proceeded from ones *Thumb*, cured by a *Cautick*. I have read of a *Cataphora* from *Worms*, a *Soporiferous Fume* from the *Womb*, and very many such sorts of Instances, which Things are now easily conceived; for 'tis but supposing a Fume of the Nature of *Sem. Animale*, or its *Aura*, (for I can no longer doubt but it is an Opiate) and it would have much the same Effects with *Opium*, if it were fit to use it after the same manner.

Having shewn, 1. Which are the predominant active Principles in *Opium*, and how combined, &c. 2. Which of them produces the usual and laudable Effects of *Opium*; And why in general; I come now to the Third Particular, viz. to shew,

III. Which of them produces its ill Effects; And why.

Its ill Effects are these, viz. *Nauseas*, *Vomitings*, which are generally very dismal, with great distress, and sometimes dangerous; *Swimming in the Head*, *Hiccoughs*, *Distresses*, *Anxieties*, *Convulsions*, *Faintings*, *Leipothymies*, *Syncopes*, &c.

1. Note, That its grievous Effects are at, or about the Region of the *Stomach*, or particularly the *Mouth* (or *Pit*) thereof, or thence arising by *Consent*.

2. Note,

2. Note, That (seeing there is nothing so good, but may cause evil *Effects* in an excessive Quantity) this Enquiry is more properly, What Principle, or Principles of Opium, do cause those ill *Effects* in an ordinary Dose? for what will in a moderate Dose, will (be sure) cause them in an excessive Dose.

3. Note, That all the constant *Effects* of Opium (as you may observe in the Enumeration thereof in the Fourth Chapter) are good and laudable *Effects*; it follows therefore, that the bad are accidental.

1. It is not the Earthy or Phlegmatick Part of Opium that causes those ill *Effects*, because they are Passive Principles, and consequently have not such a Power, besides that they are known to be innocent.

2. Opium has all those ill *Effects*, when both the Earthy and Phlegmatick Parts are separated from it, as when an Extract of well torrefied Opium is made in Spirit of Wine, for by that means the Phlegmatick Part is dried up, and the Earthy Parts subside, and are separated; yea, such Extracts made by Spirit of Wine, do cause those evil *Effects* rather more than crude Opium with its Earth and Phlegm in it, as Experience assures us, and Reason will plainly confirm by and by, however fond the World is of such Preparations.

3. It is evident from the Premises, that the Sal-Volatile-Oleosum of Opium cannot cause those Vomitings, Hiccoughs, &c. for they are the *Effects* of grievous Sensation at Stomach; but the Sal-Volatile-Oleosum causes a most agreeable and pleasing Sensation at Stomach.

4. Nothing quiets *Vomitings, Convulsions, Hiccoughs, &c.* more than that *Sal-Volatile-Oleofum of Opium*.

5. Experience informs us, That the *Sal-Volatile-Oleofum of Opium*, separated from all other *Parts and Principles* thereof, never causes such evil *Effects*, as I, and another *Physician* in *London*, can testify; as does also *Le Mort*, in the most Learned *Dr. Love's Collectanea*, where he says of such a *Preparation* thereof, as contains only the *Sal-Volatile-Oleofum*, That *Nunquam Anxietates circa Præcordia, aut Phantasias conciliat*; That is, It never causes *Anxieties* about the *Mouth of the Stomach, &c.* for that is most properly to be understood by (*Præcordia*;) *Wedelius* testifies the like of such another *Preparation*, and so do several *Authors*, tho' they did not (in the least) know why, but only by *Experience*.

6. Its *Fixt Salt* is innocent in its *Nature*, and but the 32d *Part of Opium*, which is too inconsiderable in an ordinary moderate *Dose* to cause any sensible *Effect*.

It follows therefore, That it must be the *Resinous Part of Opium*, which it has in a considerable *Quantity*, that must cause those ill *Effects*. This manifestly appears;

1. Because a *Tincture of Opium in Water*, which takes up none of the *Rosin*, but lets it fall into the *Bottom*, never causes any such ill *Effects*; which it does not also, if reduced to an *Extract* by *Evaporation*, yet have they all the usual good *Effects of Opium*.

2. *Wedelius* in his *Opiolog.* assures the same of the like *Preparation* in *Pblegm* of distilled *Vinegar*.
L. 2. Sect. 1. C. 5. P. 92.

3. An

3. An Extract of Opium in Spirit of Wine does often cause those ill Effects, and no other Preparation causes them as often. "Wedelius *ibid.* A Laudano opiato cum Spiritu Vini correcto solum ferè observavimus ortos Vomitus; a nostro vero, quod cum Phlegmate Aceti distillati fieri diximus, nunquam Vomitum, vel Nauseam saltem, contigisse meminimus. That is, We have observed Vomiting almost only from Laudanum prepared with Spirit of Wine, but never any Vomiting or Nausea from that prepared in Phlegm of distill'd Vinegar. Which he confirms, L. i. sect. 2. c. 4. p. 62. laying (in Latine) "That a curious Observation is to be noted, by which it appears, that an Extract of Opium, with Spirit of Wine, shews more Narcotick Force, by which he means, That it causes more ill Effects than prepared in distilled Vinegar; Whereas that in Spirit of Wine has nothing more in it than that in Vinegar, besides the Resinous Parts; Therefore these do cause all the Mischief.

Note also, That an Extract in Spirit of Wine has in it (Quantity for Quantity) more of the Resinous Parts than Crude Opium, both because the Earthy Parts, that help'd to make up the Bulk, are taken away in that Preparation, and because the Spirit of Wine imbibes the Resin more greedily than other Principles of the Opium; so that every Dose must in Proportion have much more Resin in it than Crude Opium. Therefore it is no wonder that it causes those ill Effects more frequently, since the Resin is most certainly the Cause thereof, as has been, and shall be more fully, and beyond all contradiction, proved.

Yet is this the Preparation boasted of by the blind and inadvertent World; it would amaze, nay terrifie a Man to see what great Care is taken

to be sure to render *Opium* mischievous, by solicitously using *Spirit of Wine* in extracting *Laudanums*; and then, and not till then, they boast of the *Preparation*, as *Charas* and very many others do, calling it, not without great *Ostentation*, (and desperate *Folly*) their *Laudanum*: May it be *theirs*, and none others; a *Turk* would be a *Madman* to use it for *Crude Opium*, because it has much more of the pernicious Principle in it; It is the common, and much esteemed way, first to extract it out of *Water*, (and then it is very good, laudable and innocent) but thought nothing worth till they extract the *Resin* (that is all left behind by the *Water*) in *Spirit of Wine*, and add it to the other; then do they with great *Authority* praise it, that is, when they have wisely added the *Poison* to the *Panacea*; It is as if they added *Ratsbane* to a *Cordial*, and not think the *Cordial* worthy *Commendation* till they have done so.

4. It appears, That the *Resin* is the Cause of those *Ill Effects*, in that they happen at *Stomach*, or from it by consent, since *Opium* has nothing in it that can offend the *Stomach* but the *Resin*; of which it was shewn in *Chap. 14.* how very offensive it is to the *Stomach* by its *Indigestibleness* and sticking to it, but even intolerable if also arm'd with *pungent Particles*, such as *Volatile Salts* have, with which *Opium* abounds.

5. It has been never observed, that any *Preparation* of *Opium*, that was separated from the *Resinous Parts*, did ever cause any such *ill Effects*. But,

6. It has been often observed, That if *Crude Opium*, or a *Resinous Preparation* thereof, was given alone in the *Form* of *Pills*, or any *solid Form*, that it was very apt to cause those *Effects*: *Wederhaus* says, That he never observed those *Mischiefs* but

but after Preparations thereof in the Form of Pills; and it follows from what he has said before, that it was either *Crude Opium*, or that horrid Extract out of *Spirit of Wine*, both which are *Resinous*.

Note, That since the very Form that it is given in doth so much alter the Case, it follows, that it is not poisonous in it self as such.

7. It is observed, That *Crude Opium*, Extracts in *Spirit of Wine*, and such *Resinous Preparations*, stay very long at *Stomach*, viz. 4, 5, 6, 7, 8, 9, 10, 11, 12, nay, sometimes 18 or 20 Hours, as *Charas* himself intimates in reference to a Gentleman that took half a Drachm of his Extract 2 or 3 times a Week, That he Vomited if he took a Clyster before 20 Hours were expired after the taking of it; That certainly argues, that it, or a great part thereof, was still at *Stomach*, which stay is a most grievous Thing to the *Stomach* when it is beyond the usual time, that Things are digested in it. Now such a stay can be attributed to nothing but the *Rosin* sticking to the Coat of the *Stomach*, for that Preparation of *Charas* had nothing in it but what was dissolved in *Water*, (which is therefore always dissolvable at *Stomach*) and the *Rosin* extracted out of the *Spirit of Wine*; therefore it was indissolvable and viscid *Rosin* that caused so long a stay, tho' that Gentleman did, by strength of Digestion, conquer it at last, and that without Vomiting, unless he (as was said) took a Clyster within the 20 Hours: Its long stay at *Stomach* is manifest also, in that after 20 Hours it purged him, and not before; which Purging (as shall be shewn hereafter, and has been in some measure hinted) happens by the Dissolution of the *Rosin* by a strong Digestion; and therefore it happens only when *Resinous Preparations* are given

in good Quantity to Men that have such a *Digestion*, or a *Canine Appetite*, as an Experienced Person in the Matter of *Opium* informed me, and I since observed to be very true.

8. It must be somewhat in *Opium* that is indigestible and sticking to the Stomach, or else it could not cause Vomiting so long as it does, that is, 12, 14, 16, or more Hours, whereas other Vomits do generally operate but for 2 or 3 Hours at farthest, and *Opium* has nothing in it indigestible and sticking but its *Resin*.

9. It is to be noted, That when *Opium* is prepared, join'd, or given, with such Things as destroy or prevent the sticking of its *Resin* to the Stomach, and help its *Dissolution*, *Digestion*, or slipping out of the Stomach, it causes no such ill Effects, tho' Crude *Opium*, or a *Resinous Preparation*, be given. Thus if you prepare it by *Lixivials*, which alter the nature of the *Resin* by (as it were) *Soapifying* it, and thereby take away its sticking Quality, and rendring it (as Soap is) dissolvable, slippery, and passable at Stomach, it causes no such Disturbances. Hence it is that *Lixivials* are found to be such true Correctors of *Opium*, (tho' the Reason has not been considered, as will appear hereafter) and that the *Sapo Tartare* makes *Matthew's* (or *Starkey's*) Pill, and the *Pilulæ pacificæ*, so safe, and free from ill Effects; as also Salt of Tartar does *Libavius's* and *Langelott's* famous Preparations; Of which expect more when I come to speak of the Preparation of *Opium* in Chap. 26. So,

10. If you subdue *Opium*, as you do *Resins* and *Turpentine's*, with the Yolk of an Egg, before you give it, it becomes safe, because you, by that means, dissolve its *Resin*, and prevent its adhering to the Coat of the Stomach, and render it digestible and passable, which is a most certain sign that its *Resin* causes those ill Effects.

11. It

11. It is for the same Reason, that Opium finely powdered, and mixed with other Things that keep its Resinous Parts from a Coalescence, as in Venice Treacle, &c. that it is not so apt to cause those evil Effects; This (I doubt not) made the Ancients, who had no better Way, give it in Electuaries finely divided among other Things, which they did so frequently, that all Electuaries came to be call'd Opiates; This (upon Experience I suppose) made Galen say, That Opium was not safe alone, but mix'd with other Things it became a good Medicament.

12. Wedelius says, That it seldom causes ill Effects when given in a fine Powder with other Things; yet is it the same in Substance, and to all Intents, but that the Resinous Parts being segregated and scattered, become more subduable, and less liable to Coalescence; whereas if it be given alone in the Form of a Pill, all the Resin falls together upon one Part of the Somach, and there sticks. Therefore Crude or Resinous Opium should never be given alone in the Form of a Pill.

13. The Blundering Ancients giving Wine to correct (as they thought) the cold Quality of Opium, found by Experience, that old generous Wine taken pretty freely after Opium, did very much prevent those ill Effects; but it could not be by correcting the cold Quality of Opium, which it has not, nor indeed for any imaginable Reason, but that being a Sulphureous Menstruum it helped the Diffusion and Digestion of the Resin, and the more for being old (as all know) because more spirituous, defecated, and vigorous; whereas had it not been for that Reason, Wine must have rather increased its Effects than otherwise, as being an Opiate.

14. It is for the same Reason, that a *Tincture* of *Opium* in *Spirit of Wine* is found to be much safer than the *Extract* made out of it, tho' the Substance is the same, because that in the *Tincture* the *Particles* of the *Rosin* are finely divided and scattered, and so subduable, and not like to stick to the Coat of the *Stomach*.

15. *Opium* in *Clysters* has kill'd People by sticking to the *Intestinum rectum*, whereas it has nothing in it, as is apparent from the *Premises*, that can hurt, by sticking to them, but its Resinous Parts; much more then may it grieve the more exquisitely sensible *Stomach* by the same means.

From what is said it will be obvious how duely to prepare and correct *Opium*, tho' there has been no true Conception thereof hitherto, but meer groundless and phantastick Imaginations.

Objection. Some may say (for the Folly of the World is great) Why should not an *Extract* out of *Spirit of Wine* be good? For since *Wine* corrects it, much more should *Spirit of Wine* do it by its more active *Sulphureous Spirit*?

Answer. So it will, if you pour it upon it in the *Stomach*, or a Digesting Pot, for then it will much contribute to its Division, Digestion, and taking off its Viscidity, as *Spirit of Wine* does in any Vessel wherein you pour it upon *Rosin*; but it is quite another Matter when reduced and reunited into the Form of an *Extract* again, and all the *Spirit of Wine* evaporated (or otherwise separated) from it, for then the Resinous Parts are in *Statu quo* of Coalescence, and want to be separated by *Wine* or *Spirit of Wine*, *Lixivials*, Yolk of an Egg, &c. as much as ever.

Obj.

Obj. It may be said, That the *Rosin* of *Opium* is but as other *Rosins*, therefore why should it offend so much in the Case of *Opium*.

Ans. For Three very manifest Reasons;
 1. That it is a *Rosin* of a peculiar *Clamminess* and *Viscidty*. 2. That it has *Acrimony* in't, as appears by its *Purging* Quality if it be given in any Quantity, and that the *Stomach* dissolves it (as was shewn.) 3. That it is join'd with the pungent Particles of the *Volatile Salt* of the *Opium*, which, when it sticks to the *Stomach*, it holds to it, tearing it too long and continually with those *Points* upon the same Part, which must cause *Distress* and *Vomitings* in Weak *Stomachs* that cannot digest it, and that sometimes to no Purpose, whereupon follows *Convulsions*, *Hiccoughs*, &c. and all *Endeavours* failing, an *Yielding* or *Succumbency*, followed by *Fainings*, *Syncopes*, *Leipothymies*, &c. and sometimes *Death* it self, for it must be a most grievous Thing to be so continually stung in the same Part of the most *sensile Membrane* of the *Stomach* without Remedy or Redress. If some have died of a little *Gum Ammoniacum*, or *Sagapenum*, sticking to the *Intestinum Rectum* or *Colon*, which are the Sink of the *Body*, and fitted for and used to bear all *Fæces* and *Trash*, much more must the nice and exquisitely disposed *Membrane* at *Stomach* be grieved by such pointed *Rosin*, as that of *Opium*, sticking to some Part thereof; besides, that the *Stomach* does peculiarly hate and loath, that any Thing, how gentle soever, should stay too long in it, which creates frequent and sad *Disturbances* in such whose *Stomachs* are relaxed, (as 'tis also in the Case of *Opium*) and cannot in due time discharge themselves of the grieving Matter: Therefore such as are mostly troubled with those dismal Symptoms after *Resinous Opium*,

Opium, are People that have fine *Textures*, and ill *Digestions*, with whom it must, and does deal for a good while, as a *Pleaser* of the *Stomach*, till the indigestible *Rosin* that is stuck to it, does therefore, and because it holds the *Points* of the *Volatile Salt* so tediously and importunately to one Part, grievously teaz and urge the *Stomach* to *Vomit*, &c. which it does in some sooner, in others later, according to their *respective Disposition* of *Stomach*. Hence it is that it operates pleasingly in some for *several Hours* before it excites a *Nausea*, &c. viz. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and more *Hours*, and in such as have a *sturdy Texture*, and *strong Digestion*, operates only pleasingly all the *time*, because their *Sensation* is not so nice, and that they gradually digest the *Rosin*, which, if the *Opium* was given in a *large Dose*, does (as *Rosins* dissolved are apt to do, especially if they have any *Acrimony* as this has) turn into a *Purger*, which brings down *Ordure* that smells of the *Opium*, and so the *Danger* is over: How common is it, that *Vomitories*, being much subdued in some *Stomach*, turn to be *Purgers*?

Thus it happens with *Dogs*, that have a *robust Texture*, and *strong Digestion*; but such *Resinous Opium* deals severely with *Cats*, and commonly kills them. You may see from the *Premises*, why it causes ill *Symptoms* oftner in *Women*, and *Children*, than in *Men*, and in *fine textur'd Men*, than the *robust*, and in such as have weak *Digestions*, rather than in them that have *strong*; why it causes all the *Symptoms* of *pleasing Sensation* at first, and the ill *Effects* afterward; why some have no ill *Effect* after it, even in a large *Quantity*, unless you'll call *Purging* an ill *Effect*; why such as *Purge* after a great *Dose* escape the *Danger*,
ger,

of Opium Reveal'd. 203

ger, as Dogs, &c. why their Vomits, especially the first, smell, &c. of the Opium, tho' the Vomiting happens after many Hours; why the Vomiting is so very tedious and severe, viz. because of the stubborn Adherence of the Resin to the Stomach; why it operates so long a time in some, in comparison of others, viz. by staying so long at Stomach.

1. All which seem to me a good Argument, That such as dye with Opium, dye while it is at Stomach, and consequently, because of the Resin which must needs be fatal in great Doses, seeing it is sometimes so very grievous in Doses of a Grain or Two, that bring People even to Death's Door with Vomiting, Distresses, Syncopes, &c. yea, and has kill'd some, even in that small Quantity, as I am inform'd.

2. Some evidently dye while it is at Stomach, because they dye soon after they Vomited up somewhat that smelled of it, tho' possibly the Resin still stuck to it.

3. Because others evidently dye of the Vomiting and its plain Effects at Stomach.

4. Because they commonly dye with a Hicough.

5. Men dye of it within the usual time that it stays at Stomach, which is sometimes 20 Hours for certain; whatever more it may be when large Doses are taken; and to me it seems an Argument of its killing at Stomach, when they dye after 20 Hours, because if it did not stick at Stomach all that time, the Operation must have been over, or, at least, much declined, and consequently the Height of the Danger past.

6. I cannot find that any have died of Opium when the Resin was separated from it, tho' I do not deny but that it may kill then, as an immoderate

derate Quantity of Wine has done. But this I can tell, that one did, at Mr. Banks's the Chymist in Walbrook in the City of London, drink (as Mr. Banks inform'd me) a Pint and a Half of such a Liquid Preparation of Opium, that had the Rosin separated from it, that had the Power of 3 Ounces of Opium in it, and it never harmed nor discomposed him, but that he Vomited about an Hour after it was taken; whether he did so by Reason of the Opium, or because the Person was Crop-sick, (as they call it) by Reason he had drank much Wine before, or both, I cannot determine.

Now (I hope) that my inquisitive Reader is fully satisfied,

1. That Opium does not act by a Cold Quality, nor by the Means of Fumes, nor any how by diminishing or disabling the Spirits, (except it be that the pernicious Rosin may do something of that kind by its aforesaid ill Effects) but by pleasantly affecting the Membranes at Stomach, Venereal Parts, &c.
2. That Sleep is caused by Relaxation, and quieting the Spirits.
3. That Pleasure, especially if intense and lasting, as that by Opium, comforts, enlivens, encourages, and causes an Ovation of the sensitive Soul and Spirits; and Displeasure causes Sadness, Dejection, &c.
4. How Pleasure must cause Complacency, Satisfaction, Content, Acquiescence, and Composure of the sensitive Soul and Spirits, as Grievances cause the contrary.
5. How Pleasure, elevating and keeping up the Spirits, and causing an entire Relaxation of the Defensive, and a great Relaxation of the Vigilative
Con-

Contraction, which tire the *sensitive Soul*, must cause *Euphory*, or easie undergoing of *Labour*, *Journeys*, &c. without *Lassitude*, as *Experience* shews.

6. How *Pleasure* causes *Relaxation* of all the *sensible Parts*.

7. How the said *Relaxation* (as in *Sleep*) does, by suffering the *Animal Spirits* to expand, and thereby making them unfit to carry *Impressions* smartly, which is necessary to convey a sense of *Pain*, (for a *smart Impression* is the very cause of it) take away *Pain*: To which you may add, That the *sensitive Soul's* attending willingly to the Sense of *Pleasure*, is diverted from *Pain*, and that a Sense of *Pain* cannot be in the same Subject with *Pleasure*, which being therefore once excited, *Pain* must disappear; but that of taking away all *smartness* of *Impression* by *Relaxation*, is a plain *Mechanical Cause*.

8. How therefore all *Fluxes* that are caused by, or require a *grievous Sensation*, or *Irritation* by *Quantity* or *Quality*, to maintain and continue them, by causing a *Contraction* of the *Parts* to squeeze out the *Humours*, must be moderated for want of *Sensation* (upon such *Relaxation*) to irritate the *Parts*, as it happens in *Sleep*, or in any Case where *Relaxation*, and thereby *Expansion* of the *Animal Spirits*, incapacitates them to carry *Impressions* smartly, which is of the *Essence* of *Pain*, (as has been shewn.)

9. How *Perspiration* must be promoted by *Relaxation*, which opens the *Pores*.

10. How, that by the same Means, *Sweat* also must be promoted, if the *Body* be full of moisture.

11. How *Opium* (or *Semen Animale*) being of the same Principles, and of like Principles with *Cantharides*, *Pismire*, *Bees*, *Garlick*, &c. must excite to *Venery*, cause *Itchings* of the *Skin*, &c.

12. How

12. How *Opium* may, by too high an *Ovation* of the *Spirits*, cause *Watching*, while *Pleasure* causing *Relaxation*, &c. may take away *Pain*; for *Relaxation*, as in *Sleep*, *Syncopes*, &c. is enough to take away *Pain*; but to *Sleep*, *Quietness* of the *Spirits* is also required, as well as their *Expansion* by *Relaxation*; so that *Pain* may very well be taken off without *Sleep*, as it often is by *Opium* that always relaxes.

13. How the *Pleasure* that *Opium* causes, is (as was said) by the same *Principles*, and therefore of the same *Nature* with that which *Animal Seed* causes upon the *Membranes*, but that *Animal Seed* causes it only upon one *Part*, and *Opium* upon the *Membranes* of the *Stomach*, *Venereal Parts*, and all other in *general*, and that only for a *Moment*, but this of *Opium* for many *Hours*, by which *Means* the *Effects* of *Relaxation* by *Pleasure* come to be more remarkable; as after much *Wine*, whose *Effects* is somewhat lasting and *internal*, as that of *Opium* is.

14. How the *Rosin* of *Opium* causes its ill *Effects* by its *Indigestibleness*, *adhering Quality*, and *redious stinging* of the exquisitely nice *Coat* of the *Stomach*, by continually teasing and urging it by its *Acrimony* and *acute Volatile Points* or *Spicula*.

Therefore having, 1. A most perfect and compleat *Sol-Volatile-Oleosum* in *Opium*, of the same pleasing *Principles* as to all *Membranes*, (as *Animal Seed* is to the *Membranes* of *Venus*) whereby they must be pleased, tickled, and relaxed; 2. A pernicious *Rosin* indigestible, sticking, and arm'd with *acrimonious* and *stinging Points*, which must highly offend the most *sensile Coat* at the *Stomach*; I am now ready (by *God's Assistance*) to explain every *Phenomenon*, or *Effect* of *Opium*, however *Amazing* and *Mysterious*, hoping they will not remain long so.

CHAP.

C H A P. XVI.

The Explication of the Effects of Opium used Externally.

ITS Effects Externally used are of Two sorts,
either,

I. As an *Opiate*, or *pleasing Tickler of the Membranes*; Or,

II. As an *Alterative* of the Parts that it is applied to.

First, As an *Opiate* or *Pleaser of the Membranes*, it has the same *Effects* as *Opium* used internally, and for the same Reason; therefore the Cause of its Operation, in this Case, will be better seen by the Explication of its *Internal Effects*, which are far more perfect, compleat, and certain.

Secondly, As an *Alterative* of the Parts that it is applied to, which are the following, *viz.*

1. It *incides*, *resolves*, and *discusses* by its pointed, penetrating, and *volatile Salt*, insinuating it self into the *Parts* and *Humours* of the *Animal*, because its Particles are fine, minute, and agreeable thereto, (as *Menstruums* to the Things to be dissolved:) Then by its *Volatility* it *discusses* what it has so *incided* and *resolved*.

2. It *molleses* and *relaxes* by its *Sal-Volatile-Oleum* so resolving the *Parts* and *Humours*, and thereby kindly loosening them; Thus *Opiates*, as
Sola.

Solanum Lethale, (or deadly Night Shade) *Hemlock*, *Mandrake*, &c. come to be of excellent Use in hard Tumours of the Spleen, Tophousness, &c.

3. It *Maturates* and *Suppurates* for the aforesaid Reasons, for nothing can better dispose towards Maturation and Suppuration than *relaxing*, *mollesfying*, and *resolving*.

4. It *exulcerates* or causes *Blisters*, or at least *rubifies* tender Skins, if it be very strong, because of its *Volatile Salt*, as *Cantharides*, *Spearwort*, and other Things do upon the same Account. But this *Effect* belongs mainly to the true *Mastack*, or $\text{O}\pi\text{Q}$, that drops from the *Incisions* made in the *Heads* of the *Poppies*, more especially the *Theban*, which affords a most powerful *Juice*, for *Exulcerating* or *Blistering* is but a stronger, fuller, and therefore *painful Resolution*, as you see by the *Cuticle* upon *Blisters* resolved into a kind of *Jelly*.

5. It is *Psilotrick* for the same Reasons, for while it so resolves the Parts, it loosens the *Roots* of the *Hair*, and so causes its *shedding*.

6. It *hurts the Eyes*, because of its *Acrimony*, by Reason of the *Volatile Salt*.

7. It *causes Itching in the Skin* by the *Titillation* of the same *Volatile Salt*, as you find by the *Application* of *Squills*, and the like.

8. It *excites Venery*, by the same *Titillation*, on the *Veneral Membranes*.

C H A P. XVII.

*The Explication of the Effects of Opium used
internally in a moderate Dose.*

NOte, That because *Opium* has been generally hitherto used either *Crude*, or with its *Resin* in it, the *Effects* of *Opium* are accordingly considered as *common Experience* thereupon has given *Opportunity* of *Observing* them ; but as I proceed I shall shew you where the *Resinous Part* of *Opium* is concern'd in the *Effect*.

1. It is manifest why *Opium* may well operate in a very *small Quantity*, as it usually does, because the least *Matter* imaginable affects the *Senses*, (as has been shewn ;) for the *Thousandth Part* of a grain of *Ambergrise*, *Musk*, &c. affects the *Smelling*, the *Hundredth Part* of a Grain of very *acrimonious Things* the *Taste*, which causes very *sensible Pleasure*, or *Displeasure*, according as it is agreeable, or not ; much easier may the exquisitely disposed *Membrane at Stomach*, which is affected with Things so indefinitely small, that no other *Sense*, or *Membrane*, can take notice of, as the *Particles of Crocus Metallorum* in *Vomits*, *Effluvias* from a *Cats Body*, *pestiferous Effluvias*, and the like ; of all which the *Stomach* is so sensible, that they thereby cause most violent *Symptoms*, which are (as was shewn) proportioned to the *Sensation*. Therefore it can be no wonder, that a *Grain*, or less, of *Opium*, should affect the *sensile Coat* of the *Stomach*, and thereby cause a *Sense of Pleasure* ; for that which is nice to discern *grieving Particles*, is so to discern *pleasing ones*,

(as has been said.) *Cujus est Dolor ejusdem est Voluptas*, that is, *Pleasure*, and *Displeasure*, belong to the same Part, and (as was shewn) in equal Degree.

This proves, That it must Operate by pleasantly affecting the *Stomach*, for it were otherwise impossible, that so little a *Quantity* should cause such remarkable *Effects*, and that before the *Opium* is out of the *Stomach*; but it is ordinary for the *Stomach* to cause mighty *Effects* by its Sensation of very small Things, otherwise insensible and inconsiderable as to the Production of any observable *Effects*; and therefore it would be a Miracle, if it did any other Way cause such great and numerous *Effects*. *Helmont* observed, That *Pro Remedio restaurativo Archæi (sive Animæ sensitivæ) non requiritur Unciarum & Drachmarum Quantitas, sed pauca Grana*; That is, *Very little serves to comfort the Archæus (or Sensitive Soul;)* because it is done by Sensation, (as I have proved.)

2. It is as evident how a hot, brisk, and *Salino-volatile* Thing, as *Opium* is, must affect the sensible Coat of the *Stomach* in a short Time, as *Vomits*, *Purgers*, &c. do; which it does much in the same Time with those Things, that is, as soon as they insinuate themselves through the *Crusta Carnosa* of the *Stomach*, and reach its sensible Coat, which is the Reason that *Opium*, *Vomits*, *Purgers*, &c. make some, and like Delay, before they Operate; which is also a Proof, that all of them Operate by affecting the sensible Coat of the *Stomach*, all the Difference being, that one affects pleasantly, as *Wine*, *Meat*, and *Cordials*, and the other by a grievous Sensation.

The Explication of the Constant Effects of
Opium used internally, &c.

I. The first and leading Effect of Opium is, causing a most agreeable, pleasant, and charming Sensation about the Region of the Stomach. This is a Property that belongs to it *omni & semper*, and indeed *soli* to Opiates, if the Degree, Duration, and Fineness of the Pleasure be considered.

How manifest is it, from what has been said of the most Compleat and Consummate *Sal-Volatile-Oleosum* of Opium, which exactly agrees in Principles, &c. with *Semen Animale*, that so highly pleases and titillates the *Membranes*, with which it not only agrees in Principles, (as was shewn) but has them more active, actuating, and titillating, than any *Membrane*, that it must of necessity highly please all *Membranes*, more especially such as are most exquisitely disposed for Sensation, as the most *sensile Membrane* at *Stomach* is, not only by its *Agreeableness*, but by a most Charming and Captivating *Titillation*, that actuates and causes a fine Ovation, and serene glowing of the *Spiritus insiti* of the *Stomach*, which makes it pleasing in the highest manner, having all the *Requisites* to cause a Sense of Pleasure! and that is not all, but it being taken into the Body, it causes a long, continued, and permanent sense of Pleasure, which we must necessarily carry along with us as a *Vade Mecum*, even Sleeping or Waking, Resting or Moving, or whatever we do, or wherever we are; by which Means, it far excels all other Pleasures, and consequently produces such mighty Effects; all other Pleasures being momentary, transitory, desultory, or interrupted, except that of Wine, and

Cordials at Stomach, which therefore have the *likest Effects* to that of *Opium*, tho' they do not equal it in the *Intenseness* or *Duration* of the *Pleasure*, unless they are repeated, (as indeed they may be) which made me to intimate, That drinking a good *Glass* of *Wine* every *Hour*, and by that Means keeping the fresh *Pleasure* thereof continually at the *Stomach*, (like that of *Opium*) is the best Way to cause a long *Euphory* of *Labour*, *Journeys*, &c. which may come near the Performance of our *Divine Sal-Volatile-Oleosum* of *Opium*, tho' never equal it for Reasons already sufficiently hinted, *viz.* because *Wine* wants its most agreeable Composition, and fine *Titillation* of the *Volatile Salt* that *Opium* and *Animal Seed* have.

Note, That the *Pleasure* of *Opium* may, to some inadvertent *Persons*, seem very indefinite, tho' it is at *Stomach*, (as it must be) because the *Pleasure* immediately relaxing all Parts, and gratifying the Sensitive *Soul*, which informs the whole, seems to be *general*, tho' Originally only at *Stomach*.

2. Our *Consummate Sal-Volatile-Oleosum* must cause a *blith*, *gay*, and good *Humour*; for being pleased with any Thing (as is the *Vulgar Observation*) causes a good *Humour*, how much more must such an *intense*, agreeable, and continual *Pleasure*, that we always, and every where carry along with us, so do! How common a Saying is it, *He was pleased with somewhat*, for I found him in a good *Humour*!

3. The like is to be said of its causing *Promptitude*, *Serenity*, *Alacrity*, and *Expediteness* in *Dispatching* and *Managing* of *Business*; for these are but natural and necessary Consequences of a *blith*, *gay*, and good *Humour*, and therefore always go together; for the *sensitive Soul* being put in

in a *fine Ovation*, by the *continual Pleasure*, is more active; and having thereupon (as was shewn) wholly excused himself from the *Care*, and solititude of the *Defensive Contraction*, and, in great Measure, of the *Vigilative Contraction* also, is more at *leisure* to attend the Managery of other Affairs without *Distraction*; besides, that he is *actuated* and *enliven'd* by the aforesaid *Ovation* of the *Spirits*, and pleasing *Titillation* into an *Alacrity* and *Promptitude* for any *Business*; with which also he is less tired, because he has (as was said) rid himself of the *Fatigue* of the *Contractions*, that (as was manifestly proved) do cause *Lassitude*, which otherwise can hardly touch or affect him at all in the State of *Relaxation*.

4. It must cause *Assurance*, *Ovation* of the *Spirits*, *Courage*, *Magnanimity*, (as *Wine* does) by elevating the *sensitive Soul* by *Pleasure*, and a high *Titillation* of the *Spiritus insiti*, by its *Volatile Parts* actuating them, as the *Animal Semen* does all *Creatures* in *Times* of *Copulation*, tho' it immediately affects only the *Venereal Membranes*, but ours does actuate them not only in those *Membranes*, but also in the more exquisitely disposed *Membranes* for *Sensation* at *Stomach*, and soon after, all over the *Body*.

5. It prevents and takes away *Grief*, *Fear*, *Anxieties*, *Peevishness*, *Fretfulness*, &c. for the aforesaid *Reasons*, which cause a *blith*, *gay*, and *good Humour*, *Promptitude*, *Courage*, &c. for it is impossible to be *gay*, and *good Humour'd*, *Serene*, *Cheerful*, *Courageous*, and *Magnanimous*, and at the same Time *Sorrowful*, *Fearful*, *Peevish*, *Fretful*, &c. If the bare Sense of an ordinary *Meal* of *Meat* at *Stomach*, which causes but a *slow Pleasure* in comparison with *Opium*, takes off the *Peevishness*, *Fretfulness*, &c. that the *grievous Sensation* of *Hunger* causes, how much more must the intense and *charming Pleasure* caused by *Opium*, that is so agreeable,

able, even far beyond *Wine* it self, (as has been set forth) take away all ill *Humours*, *Fretfulness*, *Peevishness*, &c.

Obj. But it may be said, That *Sleepiness*, which depends also upon *Relaxation*, as the *Effects* of *Pleasure* do, causes a *Peevish*, *Fretful Humour*, as is commonly observed.

Ans. It is so far otherwise in the Case of *Opium*, that it is quite contrary; for, 1. The *Sleepy* are not *Peevish*, unless you put them by some Means out of the *Pleasure* of enjoying *Sleep* or *Relaxation*, for if you let them alone they will not trouble you with *Peevishness*, nor any ill *Humour*; but it is the calling them from their *relaxed Condition*, to the grievous Task of *Contractions*, that vexes them; so that it is the *Want* of continuing under the *Relaxation* that frets them, and the more, because the *Fatigue* and *Tedium* of *Contraction* did put them upon the *Relief* of *Sleep*, of which if disappointed, they are much vexed.

But in the Case of *Opium*, you cannot so easily rob them of their *Pleasure*, which they carry continually within them in an uninterrupted manner, unless some very grievous Thing happens, which causes more *defensive Contraction* than the *Opium* causes *Relaxation*; tho' even this also is generally soon overcome by the *Pleasure* continually inviting the *Relaxation*, and promoting it, whereas the *Interruptions* thereof are *transitory*; but at the worst it is but taking more *Opium*, and the *Work* is done; for, I observe, that the *Dose* of *Opium* must be sufficient to introduce such a Sense of *Pleasure* as causes a *Relaxation* of the *Contraction* caused by the *Grievance*: Hence it is certain, that a greater *Pain* requires a larger *Dose* of *Opium*, (as has been intimated.)

6. All

6. All know, that *Pleasant Diversions*, as *Musick*, *Pleasant Fests* and *Stories*, *fine Sights*, &c. do cause *Euphory*, and an *ease* undergoing of *Journeys*, *Labour*, &c. Therefore, if such interrupted, transient, and slight *Pleasures*, do it so much, it will be easily granted me, that a continual, and more *intense Pleasure*, that is always present without any *Interruption* or *Intermission*, (as that of *Opium*) must cause a more eminent and permanent *Euphory*, proportioned to the *Pleasure*, which causing *Relaxation*, prevents the *Fatigue* (or *Lassitude*) that is caused only by *Contractions*, either *Vigilative*, *Defensive*, or *Intensive*, (as I have proved.)

So that I do not conceive, how the *Noctambuli* (or such as Walk in their Sleep) can ever be tired, if they Travelled ever so far, (if they could Eat and Drink) because the *Relaxation* of the Sleep recruits them as much as they spend of *Spirits*, &c. so Persons that cause such *Relaxation* by *Opium*, and so repeat it as to maintain the *Relaxation*, can hardly be weary; which is the true, plain, and *Mechanical Reason*, why the *Turks*, and other *Eastern People*, do, by the Help of *Opium*, perform prodigious *Journeys* without being tired; which may therefore (in *Allusion* to the *Noctambuli*) be call'd *Opiambuli*, (or *Opambuli*) as being a kind of Artificial *Noctambuli*, because they are much relax'd by the *Pleasure* that *Opium* causes, as the other are by Sleep. *Qui Lætitia afficiuntur* (says *Sanctorius*) *nullam in Itinere Defatigationem sentiunt*; That is, *The Merry are not Weary*, (as the Saying is) because *Mirth*, being pleasant, causes *Relaxation*, as *Opium* does, in some measure.

Note, That as to all the foregoing *serene* and *brisk Effects*, a full and liberal *Perspiration*, which it also causes, (as will be shewn) contributes much thereto a *posteriori*; for, as *Fire* burns slowly and dully, if the *Smoak* does by any means return upon it, and very *serene* if not, so it is with the *Flame of Life*, if clouded with, or clear'd from *Vapours* by *Perspiration*. Sanctior. Sect. 7. Aph. 17. *Melancholia superatur liberâ Perspiratione*, & Aph. 30. 31. *Educia aperiencia Gaudium movent*; That is, Such as open the *Pores*, and cause *Perspiration*, cause *Joy* or *Mirth*.

7. It *lulls*, *sooths*, and, as it were, *charms the Mind with Consent and Acquiescence*, for the several Reasons couched in the Premises, and because the *fine*, *continual*, and *charming Pleasure of Opium*, (such as some *Glasses of generous Wine* causes) must needs have such an *Effect*.

8. It *quiets*, *allays*, and *composes all Perturbations and Commotions of the sensitive Soul, Spirits, &c.* 1. Because it so *lulls*, *sooths*, and *charms the sensitive Soul*, (as is aforesaid) who is the *Original of all Motions in the Animal*. 2. Because all *Motions* are, by the *Relaxation*, proportionably abated (as was demonstrated.) Thus *Opium* takes off *Hysterick Fits*, *Fevers* from *Commotions of the Spirits*, *Convulsions*, *Stops Hemorrhages*, (or *Bleeding*) &c.

9. It causes a *Relaxation of all the sensible Parts of the Body*, by Reason of the great and continual *Pleasure* that it causes; and how *Pleasure* causes *Relaxation*, I have shewn in Chap. 14.

10. It causes *Indolence*, or *Exemption from Pain*, by causing so high and lasting a *Pleasure*; 1. Because that *Pleasure* takes up the *Attention of the sensitive Soul*, who delights in't. 2. Because a *sense of Pleasure and Pain* cannot be at the same *Time in the same Subject*, being they are *Contraries*.

3. Be-

3. Because the *Membranes* being relaxed, and the *Animal Spirits* expanded, the Impressions of Pain cannot be carried to the *sensitive Soul*, because they cannot convey Impressions smartly being thus relaxed and expanded, (as has been demonstrated by the Comparison of a Gut half full of Air, &c.) and all Impressions of Pain must be smart, or else they are not Impressions of Pain; for gentle Impressions are such as belong to Oils, smooth, and soft Things, or when the *Animal Spirits* can hardly carry any Impressions, but gently, as in Sleep, and other Relaxations, as that upon Pleasure, &c. which is our Case.

Note, That it will cause *Indolence* without causing Sleep, because Sleep requires Relaxation and Quiet of the Spirits, but Indolence requires only Relaxation, (as was shewn) which always follows the charming Pleasure of Opium.

II. It stops, moderates, or palliates most Fluxes, and promotes Perspiration; because the Relaxation takes away the sense of the Irritation of Humours, which causes a Contraction to squeeze them out, and that the same Relaxation opens the Pores, to let the Fumes out, which pass by their own Levity upon the opening of the Pores. *Nil magis* (says *Sanctorius*, Sect. 7. Aph. 6.) *reddit liberam Perspirationem quam Animi Consolatio, (aut voluptas) & Aph. 19. Animi Consolatio, quacunque de causâ, aperit meatus, & largam Perspirationem facit.*

Now you may perceive why Opium, and good Cordials, do moderate Fluxes by Stool, even before they are out of the Stomach, because the Pleasure there caused relaxes all Parts, and thereby causing an Expansion of the *Animal Spirits*, the sense of the Irritation is lost, because the Expanded
Spirits

Spirits cannot carry the *Impressions* smartly to the *sensitive Soul*, which must be, to cause a *sense* of *Irritation*, or *grievous Sensation*: By the *same Reason*, only warm *Trenchers* applied to the *Belly*, or sitting upon a warm *Stool*, &c. moderates a *Looseness*, because the *Pleasure* of the *Warmth* relaxes, and so takes away a *sense* of the *Irritation* by the *aforesaid Expansion* of the *Spirits*.

12. I have just now shewn how it promotes *insensible Perspiration*, viz. by the *Relaxation* opening the *Pores*, and letting out the *Fumes*; which I need not have mentioned again but for *Order* sake, that all may thereby see, that I evade the *Explication* of no *Effect*, nor, indeed, need I, for they are now obvious enough, even without my *Explication*, to any *Sagacious Person*; so that the *Plainness* may give greater cause to pass over some untouched, than the *Difficulty*; but it is not fit that either should cause any *Omission* in such a *mighty Concern*, that was never *Explicated*, and scarce ever thought possible.

13. *Opium* prevents *Shiverings* in *Ague Fits*, because that (for the *Reasons* *aforesaid*) it takes away the *sense* of the *Irritating Humours* that causes them.

14. It prevents and cures *Colds*, by the *Relaxation* that its *Pleasure* causes, whereby the *Pores* are kept very open, and *Perspiration* (as was shewn) promoted. Besides, that it preventing the *Sensation* of, hinders it to constrict the *Pores*, by causing a *grievous Sensation*.

15. It causes a larger and slower *Pulse*, because of the *Relaxation* that the *intense* and *continual Pleasure* causes, by which the *Arteries* are widened, and the *Motion* made slower; 1. Because the *Animal Spirits* are weakened by the *Relaxation* of their *Vessels*, and their *Expansion* thereupon. 2. Because the *sense* of *Irritation*, by which the *Heart* is solicited to move faster, is lost. 16. It

of Opium Reveal'd. 219

16. *It causes Driness in the Mouth,* (as Sleep doth;) 1. Because the *Dilatation* of the *Glandules*, by the *Relaxation*, detains and suspends the *Humours*; and 2. Because the Sensation being lessen'd, the *Membranes* that include the *Salival Glandules* are not irritated to *Contraction* to squeeze out the *Saliva* (or Spittle.) 3. Because the *Pulse* is slower to cause an *Extrusion* of the *Humours*.

17. *It has most Effect in warm and moist Weather,* because both *Warmth* and *Moisture* promote *Relaxation*, by which *Opium* does (upon the Account of the *Pleasure* it causes) perform its *Effects*.

18. *It has more Effect upon fine and lax Textures,* for the same Reason, and because their *Sensation* is more nice, and affected more with *Pleasing* or *Grieving* Things: Therefore it affects *Children* and *Women*, especially the *Nice*, and *Delicate*, more than *Men*; which may be the Reason why *Women* do not use *Opium*, in the *Eastern Countreys*, as much as *Men*.

19. *It causes an Efflorescence* (or *Redness*) of the *Skin*, (as *Sleep* or *Wine* do) because the *Skin* being relaxed, admits the *Bloud* to come into it very freely, as *Cold*, *Fear*, &c. contracting the *Parts* of the *Skin*, repel it, or squeeze it out, or back again; Thus *Persons* that drink much, get *Red Noses*, by frequent *Relaxations* of the *Skin*, which widen the *Roads* of the *Bloud* more and more; Hence it is that the *Bags* at a *Turkey-Cock's Neck* are red when he is pleased, and soon pale again when displeased.

20. *It affects the Genus Nervosum, or Animal Spirits,* (which is a common Observation) more than the *Bloud*, because it Operates by affecting *Sensation*, wherein the *Nerves* and *Membranes* are most concerned, and not by altering the *Bloud*, to which it bears no *Proportion*, to cause any remarkable *Effects*.

Note,

Note, How plainly this Concession of all Authors confirms what I said, viz. That it does not operate as an Alterative of the Bloud, &c. but by affecting Sensation, as I have proved.

21. *It increases Seed in some Measure, because it administers a Sal-Volatile-Oleosum of the same Nature with it, and by its Titillation solicites and invites the sending of its Matter that way, as is observable in such as use much Titillation; but to speak plainly and mechanically, I think that this mainly happens, because of the Relaxation of the Parts admitting (as was said of the Efflorescence of the Skin by Relaxation) the Bloud, or Materials of Seed, more freely into the Testicles, and all the Seminary Vessels, especially, being that the Titillation causes an oftener emptying of the same, in order to receive those Materials with less Opposition, for Quod intus est prohibet alienum, that is, What is within hinders the entrance of other Matter; Nothing can receive more than what it can contain, but what is often emptied can successively receive much.*

22. *It causes a great Promptitude to Venery, Erections, &c. (especially if the Dose be larger then ordinary) because being of the same Principles with Animal Seed, and (in all probability) somewhat more titillating, and of like Principles (tho' more gentle) than Cantbarides, it must highly titillate those Parts, and consequently cause a great Promptitude to Venery.*

C H A P. XVIII.

The Explication of the frequent (tho' not constant) Effects of Opium, in a Moderate Dose.

1. **I**T causes Sleep, because it highly disposes thereto by the Relaxation that its Pleasure causes. Thus Musick, agreeable Frictions, and many other Pleasures, nay, all that are consistent with lying, or sitting still, and silent, incline us to Sleep; but none can compare with the sweet, continual, and transcendent Pleasure of Opium, that we carry along with us for many Hours; whereas other Pleasures are either remiss, or interrupted, or transient in their Nature; for continuance in gentle Pleasure, as the fall of Waters, Whistling of Winds, effects much towards Sleep, so Intense does also, tho' momentary, as that of Venus; how much then must a continual and intense Pleasure cause it, especially when Rest, Silence, &c. is added thereto.

Note, That Sleep is so far from being a Property of Opium, that it does not belong to it *omni, soli, or semper*; yet People have generally look'd upon Sleep as such, which caused many Errours.

2. It causes pleasant Dreams, because the very Sleep is caused and continued by Pleasure, when it is by Opium; which Pleasure being all the time we Sleep within us, must needs suggest pleasant Dreams, or none, for how can sad and melancholy Dreams seize one that is in a gay and pleasant Condition, as far as one in Sleep is capable thereof.

3. It

3. *It stops Vomiting*; 1. As it doth other *Fluxes*, by taking away the *sense* of *Irritation*. 2. By highly pleasing, and thereby *quieting* and *composing* the *Commotion* of the *Stomach*. 3. By relaxing it, which oppose the *Contraction*, by which *Vomiting* is perform'd.

4. *It stills Hiccoughs* for the same Reasons.

5. *It causes Convulsions and Contractions to cease*.

1. Because it induces a *Relaxation*, which takes them off. 2. By taking off the *sense* which the *Irritating* causes. 3. By *composing* the *Spirits*.

6. *It causes the Meat to stay long at Stomach*, (as *Sleep* does;) 1. By *relaxing* the *Stomach*, so that it is not subject to *contract* to send it out. 2. By *stilling* all *Motions*, whereby the *Stomach* grows proportionably unactive. 3. Because the *Relaxation* opposes the *Contraction*, by which the *Menstruum* is sent into the *Stomach*, or the *Saliva* into the *Mouth*; both which are therefore much wanted in *Sleep* for the like Reason (as has been shewn.)

7. *It moderates and prevents Hunger*; 1. Because (as was said) the *Menstruum* is not so plentifully sent or squeezed into the relaxed *Stomach*. 2. Because it takes away the *sense* of *Hunger*. 3. Because it leaves the *Meat* to stay too long at *Stomach*, by Reason that it is relaxed, more insensible and proportionably languid in motion (as in *Sleep*.)

8. *It causes Sweat*, when the *Body* is full of *moisture*, (as *Sleep* doth) by relaxing, and thereby opening the *Pores*; and not (as People commonly talk) by attenuating, and the like, for a *Grain* of *Opium* bears no *Proportion* to the *Bloud* and *Humours*: That it causes it meerly as *Sleep* does, is manifest, not only because it bears not a due *Proportion* to the *Work*, as an *Alterative*, but because Men do not *Sweat* in that Case (as in *Sleep*) without much moisture in the *Body*, where-

as

as much would not be attenuated as soon as less : Therefore it is only an *Exudation* of the Humours upon a Plenty thereof, and opening of the Pores. *Sanctorius*, Sect. 1. Aph. 22. "*Invisibilis Perspiratio fit visibilis, quando Nutrimentum est nimium* ; That is, *Invisible Perspiration becomes visible (Sweat)* when nourishment (or moisture) is too much, which exactly agrees with that of *Hippocrates* cited in Chap. 13. Ἰδρῶς πλῆθος, &c.

9. It causes the *Menses* to flow, when nothing is wanting but the opening or relaxing of the *Vie* or Pores they issue out at, as when they are naturally too narrow and close ; as upon the first Tendency to them in young Girls, or when stopt by Reason of any undue *Contraction* thereof, as by Pain, Cold, Sorrow, or other grievous Passions, all which do close the Pores. Besides, it does irritate those very sensible *Venereal Parts* to *Erection* ; and I have reason to think, that it does by a general Relaxation, cause an Increase of *Bloud*, as it does of the *Breasts*, *Milk*, &c. causing, as it were, an *Artificial Puberty*, or (at least) much promoting the *Natural*, and therefore is of excellent Use in this Case in Judicious Hands, tho' little thought of in Practice.

Obj. Here I may be sure of an *Objection*, That it stops all Fluxes, but *Sweat* or *Perspiration*.

Ans. It is as false as it is a common saying, if they do not mean only such Fluxes as proceed from grievous Sensation, and Contraction thereupon ; for how can that which relaxes all Parts, stop any Flux that depends upon Relaxation ? as *Stillicidium Urinæ* by Relaxation of the *Sphincter* of the *Bladder*, involuntary Flux per Anum by the Relaxation of its *Sphincter*, and such like ; so do I speak of a Flux that may often depend upon Relaxation, (as I have shewn.)

Obj.

Obj. But it may be *objected*, That it particularly *stanches* Blood, how then should it promote the *Menses*?

Ans. *Experience* tells me it does, and *Reason* confirms it: It *stanches* Blood, by composing the Fury of its Motion, but that does not hinder, but it may relax the Pores for *Sweat*, *Menses*, *Lochia*, &c. to pass; and, why not for the *Menses* and *Lochia*, as well as *Sweat*, by opening the Pores, I would fain know? considering also the *Titillation* that it causes upon those *Venereal Parts*, which may very much solícite their *motion*.

10. It causes the *Lochia* to flow for the same Reasons that it does the *Menses*: This I have great *Experience* in.

Note, That the *Menses*, *Lochia*, and *Perspiration*, are Natural *Evacuations* that have Pores designed for them by *Nature*, the opening of which by *Relaxation* must make way for them: Suppose, when the *Blood* flows so much into the Skin as to cause an *Efflorescence*, by the *Relaxation* thereof, after *Opium* is taken, that there were Pores to carry out *Blood*, as there is for *Sweat*, why should not one flow as well as the other? But there are such Pores for the *Menses* and *Lochia*, and large ones too, and therefore it must promote them; and why should not *Relaxation* do it, as well as *Contraction*, by *Cold*, *Terrour*, *Grief*, &c. stop them? for the *Effects* of *Contraries* are contrary.

11. It causes the *Stone* to pass; 1. Because it relaxes, and so widens the *Passage*. 2. Because it may move with little or no *Pain*, which contracts the *Parts*, and so hinders its *Passage*, therefore the *Use* of *Opium*, with some other Helps, is the greatest

greatest Means that can be, or ever will be, for the Stone, till the *Dissolution* of it is found out, not only to give *Ease* in the *Case* of the Stone, but to cause it to pass; for both which *Purposes* it excells all Things, and doth both at once.

12. *It causes the Delivery of Women*, by relaxing the Neck of the *Womb*, as it does that of the *Bladder* to deliver Persons of the Stone, but in the *Delivery* of *Women* it is not to be used but in particular Cases, and by a very Skillful Hand; 1. Because it is apt to take off all the *Womens Pains*, and *Throws*, and so quite disappoint the *Delivery* for a day, 2, 3, 4, or more sometimes. 2. Because it causing a great *Relaxation*, the Parts after *Delivery* will be very unapt to close and contract duely as they should in such Cases, otherwise several *Inconveniences* may ensue. 3. It may be pernicious upon the Account of the *Evacuation* of *Bloud* that then happens. But these Things belong more properly to the Use of *Opium* in Cure.

13. *It causes Deadness of the Eyes*, (as in *Drunkeness*, &c.) because the *Cornea* is relaxed, so that the *Humours* do not fill it up to a tense *Rotundity*, as when 'tis more contracted.

14. *It causes the Pupilla to dilate*, because of the same *Relaxation*.

15. *It causes a Growth of the Breast, Penis, and Increase of Milk*, by Reason of the same *Relaxation*, as the *Pleasure* of the *Semen* upon *Puberty* does, or as *Emollients* and *Relaxers* applied to the *Breasts*, increase *Milk*, &c. by making more Room for it, &c.

16. *It causes Venereal Dreams*, because of the *Titillation* of the *Venereal Membranes* that it causes.

17. *It causes Nocturnal Pollutions* for the same Reason, and because it relaxes the Parts,

Q

18. *It*

18. It causes Itchings in the Skin, because of its Titillation by its Volatile Salt.

19. It causes much Urine, as *Cantharides*, *Bees*, *Pismire*, *Millepedes*, &c. do, by its Volatile Salt, which titillates and irritates those Parts, by its relaxing the Pores of the Kidneys, and rendring the Humours more penetrating, in some measure, by the Volatile Salt.

20. It causes a Nausea, by its Rosin sticking to, and teasing the sensible Coat of the Stomach. The Reason why it is generally so long before it causes a Nausea or Vomiting, is, that its Pleasure does at first prevent it, till at last the sticking Rosin urges it by its long Stay, and vexatious Adherence.

21. It causes Swimmings in the Head by Consent, when the Stomach is grieved by that Rosin, as you find upon Nauseas before Vomiting, or when any Thing does much offend the Stomach, as much Drink or Wine, which when they have Vomited, those Swimmings cease.

22. It causes Watching in some Persons, who are of very moveable Spirits, by actuating and stirring their Spirits by its active Volatile Salt, tho' it does at the same time please the Membranes, and consequently relax the sensible Parts, and thereby cause Indolence, the Effect of Relaxation; which it also does, when People keep themselves from Sleep by voluntary Motion, and therefore takes away Pain, even when Men Travel, &c.

Besides, there are some sort of Persons, that upon Joy, good News, Pleasure, or the like, are too much elevated, or have a restless Ovation of the Spirits, which will not suffer them to Sleep, tho' they are in a Pleasant Condition all the time; This may be the Case of some that cannot Sleep after Opium, tho' they are all the Time (as they call it) in a Heavenly Condition, for (as I have said) a
Quietness

Quietness of the Spirits is requisite to cause Sleep, as well as *Relaxation*, but *Relaxation* alone, and thereby *Expansion* of the Spirits, so that they cannot carry *Impressions* smartly, is sufficient to cause *Indolence*; and the *Pleasure* to cause a *Heavenly* (or very pleasant) Condition. Sancto. Stat. Med. Sect. 7. Aph. 28. says, That *Læticia perseverans per multos dies somnum impedit*; Persevering Pleasure may do the same, by like Reason, that is, too much Agitation or Ovation of the Spirits.

Sometimes too large a Dose causes *Watching*, by over-actuating and exciting the Spirits: *Medicum vini generosi, & Allium* (says Sanctorius) *conciliant somnum, & Perspirationem, si vero plus justo sumantur, utrumque prohibent, perspirabile tamen in Sudorem convertunt*, that is, A little generous Wine and Garlick will cause Sleep and Perspiration, but too much hinder both, yet they convert the perspirable Matter to a Sweat; which Wine and Garlick have the Nature of Opiates, and the Reason why they Sweat, is, the Quantity of the Wine affording more Moisture, Hippocrates says.

23. A dubious State between Sleeping and Waking, is caused, when the *Relaxation*, upon the Pleasure of Opium, inclines to Sleep, but the irrequiete Ovation of the Spirits, by the Pleasure and Trillation, will hardly suffer it, yet highly pleases, and puts them in a sweet agreeable Condition.

C H A P. XIX.

*The Explication of the rare Effects of Opium
in a Moderate Dose.*

1. **I**T causes temporary Pulses of the Bladder, and sometimes of other Parts, by its over relaxing the Parts, and causing thereby an Expansion of the Elastick Spirits, which (as was demonstrated) weakens their Motion.

2. Faltring of the Tongue does (as in Relaxation by Drunkenness) proceed from the same Cause.

3. Looseness of the Lower Jaw, as you see in the Drowsy and Drunken People, is from the same Relaxation.

4. It sometimes prevents Sweat, by causing a very Liberal Perspiration (as was shewn;) for (as Sanctorius says, who should know it) much insensible Perspiration and Sweat cannot consist, especially in a Temperate Person, who Eats and Drinks moderately; Therefore, if you keep a Person, that Sweats much at Night, in a free Perspiration all Day, by the Help of an Opiate, you'll much lessen or totally prevent the Sweat at Night, as in Consumptive Persons, &c.

5. It causes Abortion, by relaxing the Neck of the Womb, which also the Pleasure of Coition sometimes does for the like Reason, and would be much more apt to cause it if it continued long, as that of Opium does. Note the Inconvenience of Coition after Impregnation; This is the great Cause that Whores are not apt to bear Children, because Frequency of Pleasure does over-relax the Collum Uteri.

6. It

6. It prevents *Abortion*, when *Fear*, *Terrour*, or any contracting Cause, as *Grief*, *grievous Passions*, or *Sensations*, do threaten it, by its taking off the *Contraction* and *Grievance* that causes it.

7. *Intumescence of the Lips* is from their *Relaxation*, admitting the *Bloud* and *Humours* into them in a plentiful manner; besides, that their *Laxity*, and the *Inadvertency* occasioned by the *Diverting Pleasure* or *Drowsiness* that follows, letting the *Lower Lip* hang down carelessly (as is usual in such Cases) may by exposing much more of that *Lip* (which is most concern'd in this Effect) make it seem larger, as a hanging *Lip* does.

8. It may cure a *Dropsy*, (as *Dr. Willis* doth instance;) 1. By causing a free *Perspiration*, which is much wanted in those Cases. 2. By relaxing the *Pores*, and making way for the *Humours* to pass. 3. By causing much *Urine*, as *Cantharides*, *Millepedes*, &c. do, upon the Account of their *Volatile-Salt*, with which *Opium* abounds.

9. It cures *Stupors* that proceed from *Contraction*, as by *Cold*, &c. by relaxing all Parts.

10. It causes *Anxieties* and *Distresses*, by the *Resin* sticking and teasing the *Stomach*.

11. *Vomitings* and *Hiccoughs* proceed from the same Cause.

12. *Convulsions* are caused by the same *Resin*, while it continually urges the *Stomach* to *grievous Vomitings*, which at last draw other Parts (as the *Stomach* usually does when under great *Grievances*) into violent *Contractions* or *Convulsions* by consent, to endeavour its Assistance, because the *defensive Contraction* growing very high by the almost intolerable and tedious *Grievance* at *Stomach*, causes a mighty compression of the springy *Animal Spirits*, by which Means they grow very forcible, irrequite, and violently springy, under the urgency of an enormous *Compressure*, which causes such *Convulsive Motions*.

Note, That such a violent Compression of the *Animal Spirits* into a great springiness, is the cause of the Strength of *Convulsive Motions*, so that sometimes a strong Man can hardly hold a Child's Limb in such Cases.

13. *Syncopes, Leipothymies, and Faintings*, follow, when the *sensitive Soul* being quite tired, and overborn by the Fatigue of such Distresses, Vomitings, and Defensive Contractions, to reject and excels the said adhering and teasing *Rosin*, yields it self to Rest, and lets go the Reigns of *Contraction* as being fruitless, and no longer endurable; whereupon all the *senfile Parts* being relaxed in the highest degree, they thereby grow unfit for Sensation, and the *Animal Spirits* expand as far as the *Atmospherical Compression* permits them, so that they grow incapable to convey Impressions, by which means Sense fails, and Motion also for the same Reason, because the *Animal Spirits* loose their springy Endeavours for want of a sufficient Compression to render them suppliant for the Purpose; which is the Cause (as in Sleep) that Sense and Motion fail together; of the great Perspiration, and all other Effects of Relaxation in such Syncopes or Leipothymies, in a yet higher degree than in Sleep, wherein the *sensitive Soul* does not quite let go the Reigns of Contraction, as appears by the Motions that remain, as of the Heart, Intestines, &c. tho' far more remis in Sleep than in a Waking State.

Note, That such Leipothymies are (as was hinted) of the same Nature as Sleep is, but that they are suddain, more profound, and not so usual, natural, and of course, as Sleep is, which makes them more amazing and surprizing; therefore it follows, that they are (as Sleep is) a Means of Recruit,
when

when all working and tugging by *Defensive Contractions* fail, and so the last *Refuge* of the *sensitive Soul*, when over-tired, in order to recover Strength for a fresh Engagement with the *Enemy*; (as being tired at *Night*, the *sensitive Soul* loosens the Rigns of *Contraction* to enable him the better to fall to his *Work* the next Day :) This you'll find by all *Reason* and *Experience* to be the true State of *Leipothymies* upon *Grievances* and *Fatigues*, tho' not hitherto minded (that I know of.)

Many true and useful *Consequences* do hence follow; as, That we are not always to disturb them, or put them out of these *recruiting Leipothymies* by grievous Means, as *Prickings*, *Pinchings*, &c. but only by *Cordials* and *Refreshing Things*, as you would Treat a Person much tired; or by letting them take their *Nap* (if I may so call it) if there be not very eminent Danger. But 'tis endless, and besides my Purpose, to make a particular *Discourse* of this Matter, which will belong more properly to my Tract of *Animal Mechanism*.

14. *Death* happens sometimes, tho' very rarely, and that in very *weak People* that take little or no *Sustenance*, because *either* when fallen into such *Syncopes*, they never come out of them, by Reason that they have not within them wherewith to recruit their *Spirits*, or, that *Opium* taking them much spent and tired with *Distempers*, causes, as in weak and wearied People, a most *profound Sopor*, which not recruiting them, who take or digest no *Sustenance*, they must rather grow weaker and weaker, (for somewhat is spent while we live) and consequently the *Sleep* or *Sopor* more and more *profound*, till they Sleep their last, for want of some *Recruit*, which is the very Thing that naturally lessens *Sleep* and awakes us, when there is no

other apparent Cause; for as the being *tired*, and *want of Recruit*, causes Sleep, so the *having it* causes *Waking*, or (which is the same in Effect) no farther need of *Relaxation* for Recruit's sake, so that the sensitive Soul fall to his useful Work of *Vigilative Contraction* for Sense and Motion's sake.

15. It sometimes causes *Purging*, which happens (as far as I have observed, or can learn) only when it is given in a good Quantity to Persons of a *strong Digestion* or *canine Appetite*.

The Case is thus; When Persons, that are of a *strong Digestion*, take a *Resinous Opiate* in good Quantity, they do in great measure by their fixed Salts at Stomach, and *strong Digestion*, subdue the *Volatility* of the *Opium*, and dissolve its *Resin*, which then (as *acrimonious R sins*, or *Vomits* subdued by *fixt Salt*, use to do) causes *Purging*; Hence it is, that it generally (if not always) *Purges Dogs*, and People of a high *canine Appetite*, and that sometimes meeting such fixed Salts, it *Purges the Consumptive*. *Bartholine* says, That *Mandrake Juice* purges when it meets with *acrimonious fixed Salt*. *Eraustus* and *Quercelan* do agree, That it has a *Purgative Quality*, but that it does not always exert it; 1. Because it takes away the Sense of *Irritation*. 2. Because it is given in too small a *Quantity*. The *Reasons* are Just and Right, and not only consistent with, but confirm what I say.

Note, That this is not intended of the *Purging* that happens after the *declination* of its Operation, which is (as you'll find) from another Cause, therefore this does not smell of the *Opium* as the other does, because it is past and gone before that in the *Declination* happens; Of which more in its proper Place.

16. It raises and revives some Persons that are almost expiring, in Two Cases; One is, when such as have been used to take it are even expiring for want of it (of which more hereafter.) The other Case is, when violent Contraction, as from Pain, Cold, Vomitings, and Grievous Passions, as Terrour, &c. are the Cause, that People are almost expiring, for it takes off the Contractions by relaxing, &c.

17. It stays very long at Stomach, when the Resin thereof sticks to the Stomach, and is there detain'd; Besides, that the Stomach being relaxed, and having little sense or motion, (as in Sleep) does not soon digest it or discharge it: It is fine in this Case, and all other, to observe how Sensation and Motion go Hand in Hand, keeping equal Pace and equal Proportion, as it plainly must be by the Principles of Relaxation and Contraction, which I have stated and proved.

18. It causes stoppage of Urine sometimes (especially in old People) by over relaxing, and causing a kind of a temporary Palsie of the Bladder, (as was shewn) and taking away the sense of the Irritation of the Urine, which should contract the Bladder to squeeze it out; by which Means it happens sometimes, that the Bladder comes to be so over extended beyond its due Tone, that they cannot contract it to make Water; in all which Cases strong Contracters, as Cold, Terrours, &c. immediately cures them; the very putting the Scrotum to the Edge of a cold Chamberpot has effected it several times by my Advice; tho' (if need be) you must come to Dashing of cold Water upon the Region of the Bladder, or Pumping on it, or Dipping in it, &c. so Terrour, and causing a very smart Pain, especially near those Parts, will do much, but Cold is the readiest and best Remedy.

19. It sometimes proves dangerous after great Hemorrhages or Evacuations, as Tapping in Dropsies, &c. because the Relaxation hinders the Parts duely to contract upon what remains, which may cause great Mischiefs, as Discontinuation of Motion, &c.

Thus have you all the constant, frequent, and rare Effects of Opium, taken internally in a moderate Dose, so naturally, easily, plainly, and mechanically explicated, that People may (in my Judgment) more admire, how all fail'd of discovering the manner of their Production, than that I found it; as Men are apt to think of the Circulation of the Bloud, which now (as I hope the Effects of Opium do) seems very obvious; both which Cases are to me very strong Arguments of a Being that rules and disposes, darkens and illuminates, &c. as he pleases, when I consider, that both the Circulation of the Bloud, and the Cause of the Operation of Opium, (viz. Pleasure at Stomach, &c.) fell under the Senses of many Millions, who in one Case saw the Bloud move, and in the other felt the Pleasure, yet was neither discovered for many Thousands of years; especially considering also, that in the Case of Opium Thousands of Ingenious Men have diligently enquired after the Cause of its Operation, who made no farther step in't than to state Things that have not as much as Existence, (viz. a Cold Quality, and Fumes flying from the Stomach to the Head) to be the Cause thereof. Therefore it is plain, That neither is he that Planteth any Thing, neither he that Watereth, but GOD, that giveth the Increase, of Knowledge, and of other Things: To whom be all Glory.

C H A P. XX.

The Explication of the Effects of the Declination of the Operation of Opium in a Moderate Dose.

1. **A** General Return of all Diseases and Disasters, when the Operation of Opium is over, because it does not (as was shewn) operate as an *Alterative*, but a *pleasing Diverter* of the *sensitive Soul* for some Time, during which it causes a *general Relaxation* of all the *sensible Parts*, whereby the *Animal Spirits* being expanded, grow unfit to convey *Impressions* smartly, which is requisite to cause a *sense of Pain*, &c. (as has been often said.)

But it cures several *Distempers*, viz. such as *pleasing* and *comforting* the *sensitive Soul*, *composing* the *Spirits*, *Relaxation*, *Perspiration*, *Sweat*, &c. can quite take away; Of which more particularly when we come to speak of the *Use of Opium in Cure*.

2. *Sweat* happens in the *Declination* of its Operation, as Sir *Theodore Mayer*, *my self*, and others, have observed, because that now all the *Parts* contracting, which by their *Relaxation* suspended all *Humours* during its Operation, do *Mechanically* squeeze out the congested *Humours*, there being less *Room* in the *Body*, as was said of *Sweat* upon awaking, by the *Return* of the *Vigilative Contraction* after *Relaxation* during the *Sleep*, which is to be compared to the *Relaxation* during the Operation of *Opium*, and the *Return* of the *Contraction*,

traction, when 'tis ended ; besides, that both upon the *Going off of the Operation*, and *Awaking*, the Motion of the Heart growing more vigorous, (as it does upon Motion by the *Intensive Contraction*) does more powerfully propell the *Humours* out at the *Pores* (as happens in *Sweat upon Motion.*)

3. *Frequent making of Water* happens, partly by the *Titillation* of the *Volatile Salt* (as by *Cantharides*, &c.) that is now separated from the *Bloud* ; partly by the *Contraction* of the whole *Body* squeezing it out at the *Kidneys*, as when *People* are *Cold*, they make more *Water* for that Reason.

4. *A Looseness* may, and does happen sometimes from the like *Contraction* squeezing out the *Humours* that were suspended during the *Relaxation* by the *Opium*, which is common for such *Contractions* to cause, as by *Cold*, *Terror*, &c. and because *Sensation* grows more nice and irritable by the *Humours*, by Reason of the *Contraction*, which is the more for the *Grievance* of failing of the *Pleasure of Opium*. Therefore,

5. *Diseases*, *Pains*, &c. seem worse upon the *Return* of the *Grievances*, because of the great *Ease* they had during the *Operation* of the *Opium*, *Contraria inter se magis elucescunt* ; and it is particularly observed of *Pleasure*, That it leaves *Men* worse then it found them. Thus a *Man* is worse, more sad, &c. *Post Coitum*, more *Melancholy* after all sorts of *Pleasure*, insomuch that it is grown to a *Proverb*, viz. *After Merry comes Sorry*, (or, *After Mirth comes Sorrow* ;) as also *Minus gaudebis, minus dolebis*. Therefore,

6. *Melancholy* does often (if not always) happen in some degree, after its *Operation* is ended ;
 1. Because of the *Return* of the *Contractions* (or *Toil*) of the *sensitive Soul*. 2. Because (as was said) the *Sense of Pleasure*, newly lost, aggravates

vates the Sorrow, as has been shewn after Coition, &c.

7. *The Pulse is narrow*, because the *Contraction* returns with *Melancholy*, and *Return of Disasters* improve when that so happens, as it generally does.

8. *Itching of the Skin* happens about this time, because that now the *Volatile Salt*, which causes *Titillation*, is arriv'd as far as the *Skin* upon its march out of the *Body*.

C H A P. XXI.

The Explication of the Effects of Opium in an Excessive Dose.

THE Cause of most of these Effects will be evident from the Explication of the former, because the Difference is only in the Quantity of the Opium, therefore I am often necessitated to speak much the same as I have done before.

You cannot expect any good Effects from its Excess, any more than you have from Wine, (tho' the best of Cordials, next to the *Sal-Volatile.Oleosum* of Opium) but rather less, because Opium is join'd to a pernicious Resin, which you may be sure will be very grievous to the Stomach in great Quantities, if it was so in little.

The Evil Effects in this Case, do mainly proceed, either from too much Relaxation, as in Drunkenness, or, from the Resin at Stomach.

1. A Heat at Stomach is caused by the intense Heat of the Opium in a great Quantity, it being sensibly a very hot Thing.

2. The Sense of Weight at Stomach is caused by the great Relaxation that it causes, which renders the Stomach proportionably weak, and unable to endeavour its own Relief, so that the Resin, &c. lie heavy upon't; Thus we find a great Heaviness at Stomach, when any Thing grieves it, that it cannot reject or discharge.

3. Gaiety

3. *Gaiety of Humour* is caused at first (as by the *Pleasure* of a great Quantity of *Wine*) by its pleasing *Agreeableness* to the *Membrane* at *Stomach*, till the *Relaxation* grows enormous, as by a great Dose of *Wine* suddenly drank, to which it is very like in all its *Effects*, except such as proceed from the *Rosin* sticking at *Stomach*, which *Wine* has not.

4. *Sardonick Laughter* is caused (as you see in *Drunken People*) when they are disabled by the great *Relaxation*, that they cannot well Express themselves by the failing *Tongue*, they endeavour it by a silly kind of *fained* or *made Laughter*, (as they call it) while the pleasing *Tirillation* at *Stomach* much inclines them to *Mirth*, if they knew how to manage and carry it on.

5. *Laxity, and consequently Debility of all Parts*, is caused by the extraordinary *Relaxation* of them by a continual and permanent sense of *Pleasure*, which happens considerably in the *Momentary Pleasure* of *Venus*, much more in this *continual* and *lasting Pleasure*, when a great Dose makes it intense, as in *Drunkennes*.

6. *Alienation of the Mind* is caused (as in *Drunkennes*) by an over-*Relaxation* of the *Brain* and its *Membranes*.

7. *Loss of Memory* happens by the same Means, (as in *Drunkennes*.) So,

8. *Darkness of Eyes* is caused by a *Relaxation* of the *Coats* and *Membranes* of the *Eyes*, but mainly by the *Expansion* of the *Animal Spirits* by that *Relaxation*, which (as in *Sleep*) renders them unfit to convey the *Impressions* of *Light*, &c.

9. *Laxity of the Cornea* is from the same *Relaxation*.

10. *Appearance of various Colours* happens by (as was said) the unevenness of the *Cornea*, &c. when so relaxed, whereas when 'tis duely contracted it is round, even, polite, and truly represents Things.

11. *Dead.*

11. *Deadness of the Eyes to the View*, is (as has been shewn) from the *Laxity* of the *Cornea*, which makes it flag, lie loose, look dully, and not duely reflect a *smart* and *brisk speck* of *Light*, as it does when *tense*, *round*, and *polite*, by its *Contraction* on the contain'd *Humours*, which then duely fill it.

12. *Faltring of the Tongue* is from the same *Relaxation*, as in *Drunken Persons*.

13. *A Sopor* is from the same *Relaxation* over all the *senfile Parts* of the *Body*, by which Means *Sense* and *Motion* are diminished or lost by the *Expansion* of the *Animal Spirits*, which (as has been said) being not duely compressed, become unfit for both at the same time.

14. *A slow and wide Pulse* is from the same Cause, because the said *Relaxation* permits the *Arteries* to widen, and the *Animal Spirits* to expand, and consequently renders the *motion* of the *Heart* *slow*, which is the cause of the *Pulse*.

15. *A high Colour* or *Efflorescence of the Skin*, has been explain'd.

16. *Looseness of the Jaw and Lips* is from the same *Relaxation*, (as was shewn;) and so is,

17. *Intumescence of the Lips*, (as has been shewn)

18. *Difficulty of Breathing* may be from *Two* different Causes; either by the *Relaxation* weakening the requisite *Motions* for want of *Compressure* of the *Animal Spirits*, and by the *Flaccity* of the *Parts* themselves; Or, by a great *Grievance* at *Stomach* upon the *Account* of the *Rosin* sticking to it, and causing a *Convulsion* of those *Parts*; both which may happen.

19. *Fury and Madness* may also happen, either by the exalted *Pleasure* of its *Titillation*, as in *Drunwards*, who therefore scarce know what they do, the *Mind* being (as was said) *alienated*; Or it may happen (as I have often known a kind of *Madness* to be produc'd) by a great *Grievance* at *Stomach*;

Stomach; which may well be from the *Rosin* grieving and teasing the *nicely sensible Stomach*; They may be easily distinguished, one (*viz.* that from the *Rosin at Stomach*) being with great *Distresses, Anxieties, Convulsions, &c.* and the other without any.

20. *Venereal Fury* proceeds from the high *Titillation* of the *Venereal Membranes* by the *Volatile Salt* of so much *Opium*, as if *Cantharides, Bees, &c.* were taken internally; but that these cannot so agreeably titillate those Parts as *Opium* does, whose *Volatile Particles* are render'd more pleasing by *oily ones*, and therefore much of the Nature of *Semen Virile*.

21. *Priapisms* are caused by the same continual *Titillation*.

22. *Violent Itchings of the Skin* are caused by the same tickling *Volatile Particles* in great Abundance, proportionable to the *excessive Dose*.

23. *Nauseas* are caused by the *Rosin* sticking at, and soliciting the *Stomach* to *Vomit*.

24. *Swimmings in the Head* are by consent, because the *Stomach* is grieved by that *Rosin*, as is observed in many Cases from a grieved *Stomach* upon a *Tendency to Vomit*, as when it is overladen with *Wine*, or *indigestible Victuals*, or when Persons are *Sea*, or *Coach-sick, &c.* for it is not in these last Cases, because the *Brain* is offended (as People imagine) that they are *Sick*, or *Vomit*; but the *Swimming in the Head*, and *Offence of the Brain* happens, because the *Stomach* is offended by the Motion of the *Coach* or *Ship*, by Reason of its most exquisite Sensation, which the *Effluvia* of a *Cat*, *pestiferous Particles*, and *Commutations* caused by *meat Passion*, can, and do offend, (as was said) so as to cause *Vomitings, Anxieties, &c.* much more then may the Motion of a *Ship* or *Coach* do it. I shall not here enter into Contro-

verſie with thoſe that aſſert, That it is the *Head* is firſt offended in a *Coach* or *Ship*; it is ſufficient for my *Purpoſe*, that *Grievances at Stomach* do commonly cauſe *Swimmings in the Head*, for taking off thoſe *Grievances* cures them, as *Eating* when it is from the *Grievance of Hunger* or *Wind at Stomach*, and diſcharging the *Stomach* of a great *Load of Wine, Ale, or indigeſtible Matters*, when ſuch *Things* cauſe it, do cure ſuch *Swimmings in the Head*.

The *Way* how *Grievances at Stomach* do cauſe thoſe *Swimmings*, is by cauſing a *Contraction* (as all *Grievances* do, but eſpecially thoſe at *Stomach*) of the *Membranes* of the *Brain*, as it does of all other, but mainly of theſe, becauſe very ſenſible; by which means the *Animal Spirits* being compressed, grow more *irrequite* and ſkipping up and down, and the *Compression* not being continually alike in general, or the *Arteries* affording an uneven and forcible ſupply of them (or *Fumes*) from the *Bloud* by the *Compression*, nor affecting all *Parts* of the *Brain* with equal *Force*, becauſe the *Pleaſure* endeavour to relax, &c. there muſt thence ariſe *Eddies, Vortices, or Whirls* thereof, which cauſe *Swimmings, Vertigo's, &c.* according as they happen to be moved.

That they happen from ſuch *Contraction* is manifeſt;

1. Becauſe the *Grievance at Stomach* can add nothing elſe to the *Brain*, or its *Membranes*.
2. Becauſe they are taken off by pleaſing the *Stomach*, and conſequently by *Relaxation*, as by a *Glaſs of Wine, Victuals, an Opiate* that is not reſinous, &c.

It is here well worth your notice, That all consent of Parts (a Thing much admir'd) is only by Contraction or Relaxation, which suddenly affect the whole Systeme of the Nerves and Membranes.

25. *Vertigo's* are from the same Cause.

26. *Vomitings* are caused (as was said) by the great Grievance of the acrimonious Resin sticking to the Coat of the Stomach.

27. *Hiccoughs* are from the same Cause, which happen upon the decay of Power vigorously to Vomit, dwindling into those fruitless *Convulsive subsultory Jerks*, or Half Endeavours.

28. *Distresses and Anxieties* must necessarily attend such a grievous Sensation and Defection of Nature's Endeavour, as being overborn and disabled to work for it self.

29. A turbulent Pulse must be an Effect of the foregoing Tumults.

30. *Convulsions* happen (as was shewn) by the enormous Compression of the Animal Spirits, by Reason of the violent Contraction upon the great Grievance by the Resin at Stomach, which causes them to skip and fling up and down very forcibly under the squeeze of the Compression, and possibly skirmishing under the Vicissitudes of it and Relaxation.

31. *Faintings and Leipothymies* are caused (as has been explain'd) by the sensitive Soul's being over-tired by the Fatigue of Defensive Contraction, and yielding himself to Rest from all Contraction, as the last Relief, &c. whereupon Sense and Motion do fail for want of Compression to render the Spirits springy, active, and fit for the Purpose.

32. Cold Breath is but a necessary Consequence of the Loss of Motion, and therefore of Heat, by such *Leipothymies and Faintings*.

33. *Death* is caused Two manner of Ways, that is, either by an utter *Expense of Spirits*, and thereupon a *Dereliction* (or *Extinction*) of the *sensitive Soul* by reason of those *Distresses* and *Fatigues* upon the Account of the *invincible Rosin*; Or by too much *Relaxation* disabling all the *motions* of the *Body*, as in such as dye being dead *Drunk*, which looking not unlike an *Apoplexy*, makes *Authors* say, that *Opium* causes *Apoplexies*.

Such as escape *Death*, do so generally by

34. *Plentiful Purging*, which is occasioned by a great *Quantity* of the *Rosin* of *Opium* meeting a strong *Digestion* and fixed *Salts* (as has been said.)

35. *Sweats* that *smell* of the *Opium* are caused,
1. By the *Openness* of the *Pores* by *Relaxation*.
2. By *Plenty*, or at least sufficiency of *Moisture* for that *End*; for otherwise (as was shewn) it would be only *insensible Perspiration*. 3. By the great *Quantity* of *Volatile Salt* attenuating the *Humours*. 4. By the strict, intimate, and even indissoluble *specifick Union* or *Combination* of the *Volatile Salt* and *Oily Parts*, which makes it hold its *specifick Smell* to the last.

36. *Violent Itchings* in the *Skin* must of necessity follow a great *Quantity* of *Opium*, since it causes such *Itchings* (as was shewn) in a *small Quantity* by the *Titillation* of its *Volatile Salt*.

Note, That these *Effects* do not all happen to all Men that take it in an *excessive Dose*, but some to one, and some to others, (as was intimated in *Chap. 5.*) according as they are more or less troubled with the *Rosin*, *Quantity*, *Relaxation*, &c.

C H A P. XXII.

*The Explication of the Effects of a long and
lavish Use of Opium.*

AS an *Excessive Dose* of Opium is *Intemperance* for one time, so a long and lavish Use of it is an *habitual Intemperance* for a long time; therefore if you could not rationally expect good Effects in that Case, any more than from the best Wine taken suddenly in a vast Quantity, it follows, that you cannot expect good Effects from an *habitual Intemperate Taking* of it, any more than from a long and lavish Drinking of Wine, tho' both are excellently good in their Kind, (but that the Opium has the pernicious resinous Part join'd with it;) There is nothing so good, whereof an *intemperate Use* is not *mischievous*, God having so ordered it to deter from, and punish *Intemperance*, and the *Abuse* of his Creatures; Therefore ill Effects are not always to be imputed to the *viciousness* of the Things used, but frequently of the Person that imprudently uses them.

1. *Relaxation and Debility of all Parts* is contracted by the habitual over-relaxing thereof by the *lavish Use of Opium*.

2. *An Inhability of doing any Thing without it* is contracted by the habitual Pleasure, Comfort, Promptitude, and Euphory it causes when taken, without which the *sensitive Soul* becomes lazy, listless, and averse to all Actions; it is as if a Man, used to Dance to Excellent Musick, were required to do it without any Musick at all, nor as much as Thoughts of it, or mumbling it within

himſelf; Or that one who Drinks nothing but *Wine*, and Eats the beſt, ſhould be ſuddenly denied both, and forced to live upon *Bread* and *Water*; Or, that ſuch as always take *Tobacco* at their *Studies*, ſhould be ſuddenly debarr'd thereof, and required to Study without it; How very liſtleſs would a Man be in ſuch Caſes? Tho' hardly any of the *Compariſons* come up to that of *Opium*, becauſe of the charming *Pleaſure*, mighty *Euphory* and *Promptitude* that it cauſes; it is as if one were ſupported, and wholly depended upon *Cordials*, and ſuddenly denied them, &c.

3. *An Inability of getting up in the morning till it is taken, and begins to operate*, proceeds from the ſame Cauſe. A *Mechanical Reaſon* may be expected here alſo as to theſe Matters, but it will hardly bear it, any more than how the *Will* or *Appetite* cauſes the firſt *Impulſe* toward voluntary *Motion*; all that can be ſaid is, that without the *Opium* the ſenſitive *Soul* is, when he does any Thing, to act under the *Toil* and *Difficulties* of a full *vigilative Contraction*, (as being awake) *inrentive Contraction*, (as acting) and *deſenſive Contraction*, (as being grieved) when the *Operation* of *Opium* is over, (as after *Venerereal Pleaſure*, &c.) ſo that now he labours under the great *Diſadvantages* and *Drudgery* of all the *Three Contractions*, whereas by the *Pleaſure*, fine *Titillation* of *Opium*, and *Relaxation* conſequential thereunto, he was eaſed of all the *Deſenſive Contraction*, which is the moſt grievous, and in great meaſure of the *Vigilative*, (as has been ſhewn) which makes *Working*, *Journeying*, &c. very eaſie to him; Therefore it is as if one that delights in *Muſick*, Danced to Charming *Melody* in beloved *Company*, with pleaſing *Refections* of *Wine*, &c. and in the other Caſe, as if one laboured in *Grief* or *Pain*. Now ſuppoſe that one, uſed never to Act or Work without ſuch
mighty

mighty Pleasant Advantages, and Causes of Euphory, were required to act under the Pressure of the Three Contractions, (or in Grief or Pain) how listless would he be to Act, Work, get up, &c.

4. A dull, moapish, and heavy Disposition, must be the Effect, unless it be while they please, comfort, and enliven themselves by the Opium, because their Brain is habitually over relaxed; which is the very Case of old Drunkards, who have (as 'tis said) drank away their Parts by such an habitual Relaxation of the Brain, (which over-much Sleeping causes also upon the Account of the like Relaxation) therefore they must be moapish till the pleasing Tutillation of Opium enlivens them.

5. Diminution of Appetite is caused by an habitual Relaxation of the Stomach, taking away its Sensation, and suspending the Menstruum from flowing to it as freely as it should, and would, if there were a due Contraction to squeeze it out.

6. Weakness of Digestion happens from the same Causes.

7. Dropses are caused by the Relaxation weakening the Parts, and making them thereby susceptible of Humours; as also by Diminution of Appetite and Digestion, (as in old Drunkards)

8. Decay of Parts (or Wit) happens from habitual Relaxation of the Brain, and its Membranes, (as in old Drunkards.)

9. Weakness of Memory proceeds from the same Cause (as in old Drunkards.)

10. Stooping in the Back is caused by the habitual Relaxation of the Parts, which weakens and causes them to comply with our Tendency and Use of bending forward, and yield to the greater Weight, that is (generally speaking) on the fore-side of the Back-bone (or Perpendicular;) so that Stooping must gradually follow those conspiring Causes, as it does in habitual Drunkards, whose Parts are relax'd.

11. *Early Decrepiteness* must proceed from the aforesaid *Relaxation* spoiling the Tone of Parts, and causing *Want of Appetite, Digestion, &c.* (in the manner before shewn.)

12. *Shortness of Life* must be the *Effect* of the same Causes.

13. *Acrimony of Blood* proceeds from the Abundance of *Acrimonious Volatile Salts* taken in the *Opium*, wherein it is much more acrimonious than our natural *Volatile Salt*, and in greater *Quantity* proportionably ; Therefore it can be no Wonder, that,

14. It excites *Inclination to Venerly* by that acrimonious *Salt*, which is *analogous* to that of *Cantharides, Ants, Bees, &c.*

15. *Frequent Inclinations to make Water* is also a know and common *Effect* of such a *Salt*, by its irritating and soliciting the *Bladder, &c.*

16. *Priapisms and frequent Erections* are, and must be from the same Cause.

17. *Nocturnal Pollutions* are necessary Consequences of the *Relaxation* and the *Titillation* caused by those *Volatile Salts*, (as was said.)

C H A P. XXIII.

The Explication of the Effects of Leaving off Opium, after a long and lavish Use thereof.

I. **G**reat, and even intolerable Distresses, Anxieties, and Depressions of Spirits, do happen;
 1. Because the *sensitive Soul*, who is so much comforted, diverted, and supported by the habitual and dearly beloved *Pleasure* that *Opium* causes, being suddenly deprived thereof, (by which it was mainly sustain'd) is exceedingly disappointed and cast down. 2. Because he now labours under the fore Burthen of the *Three Contractions*, so that every Thing seems, and is really more grievous to him; for now it acts as one in *Pain* or *Grief*, and every Thing affects him more smartly proportionable to the *Compression* caused thereby of the *Animal Spirits*, unless he returns to the *Pleasure* of *Opium*, which elevates it again; Or uses *generous Wine*, as its *substitute*, tho' it does not equal it, either in the *Intenseness* or *Duration* of the *Pleasure*, unless repeated (as I have some where directed) once in Half an Hour, or an Hour, in a moderate manner, which causes a *continuance* of the *Pleasure*, tho' it cannot equal the *Intenseness* of that of *Opium*, which therefore has the greater *Effects*.

II. *A Return of all Diseases, Pains, and Disasters*, must happen generally, because the *Opium* takes them off by a bare *Diversion* of the *Sense* thereof by *Pleasure*.

III. *Dangerous Loosenesses* happen sometimes, because the *Sensation* grows more grievous; for, as the *pleasant Sensation* caused by *Opium*, takes away

way the *Perception* of the Irritation of Humours, so the *Grievance* of Losing that *Pleasure* causing *Contraction*, makes all *Sensation* smarter, and consequently more irritating, so that the *Humours* have thereby more of the Effect of *Purgers*, which operate (as all agree) by *Irritation*; Besides, that the *Humours* before detain'd and suspended by *Relaxation*, (as in *Sleep*) are now therefore pour'd down in greater *Quantity* by the advanced *Contraction* squeezing them out, as the *Return* of the *Vigilative Contraction* after *Sleep*, causes Men to be more apt to go to Stool upon awaking, or getting up in the *morning*; which may be well compared (in some measure) to *Purging*, after Leaving off the Use of *Opium*, since it relaxes as *Sleep* does, and that for a much longer *Time* by a continued Use thereof.

IV. *Death commonly follows*, for all the Reasons aforesaid, especially the great and intolerable *Distresses* of Soul that they are under, unless *Opium* be used, which soon sets them right, or *Wine* (its *Substitute*) so frequently used, as to continue its *Cordial Pleasure* at *Stomach*.

Nothing now remains but to take a short *Review*, to see whether I have explain'd all the amazing *Contradictions* that seem to be in the *Effects* of *Opium*; for tho' it is really done, yet may it not so well appear as when set one against the other. It would be *Tautology* to repeat all the *Reasons*, therefore I shall only mention them in the close Order I at first enumerated them, that you may see that they are all explicated in the former *Discourse*.

You may well remember, that I have shewn;

1. How it causes *Sleeping* and *Watching* (in divers Persons.)

2. How

2. How it *causes* and *prevents* Sweat.
3. How it *relaxes* and *stops* Loosenesses (even by *relaxing*.)
4. How it *stops* Fluxes, and *promotes* Sweat and Perspiration.
5. How it *stupifies* the Sense of Feeling, yet *irritates* it.
6. How it *causes* Stupidity, (if you sit or lie still) otherwise *Promptitude* in Business.
7. How it *causes* Cloudiness and Serenity ; That, if one lies still and dozes ; This, if he keeps in Action ; That, by an excessive and lavish Use thereof, which causes Moapishness ; This, by a temperate occasional taking thereof, especially in the Morning, upon Journeys, &c.
8. How it *excites* the Spirits, yet *quiets* and *composes* them in Hysterick Fits, Diarrhoeal Fevers, from Pain, Commotions, &c.
9. How that it is *very* hot, and *takes* of Fevers.
10. How tho' it is *hot* and *bitter*, yet it *lessens* Appetite and Hunger, which is a grievous Sensation, by causing a *pleasant* one.
11. How it sometimes *stops* Urine, by *relaxing* the Bladder, *suspending* Humours, &c. and *promotes* it by its tickling Volatile Salt, as Cantharides, Bees, Ants, &c. do.
12. How it *relaxes*, and *thereby* *weakens*, as in Sleep, &c. yet *enables* to perform Labour, Journeys, &c. with great Euphory, by *divertive* Pleasure.
13. How it *causes* and *prevents* Abortion ; That, by *over-relaxing* ; This, by *allaying* Pains, Terrours, &c. that might cause it.
14. How it *stops* Vomiting by taking off Irritations, &c. and *causes* it by the Adherence of its indigestible and viscid Rosin.
15. How it *stops* Purgings, and sometimes *causes* it by the Dissolution of its Rosin by a strong Digestion,

gestion, fixed Salts, &c. when its Quantity is considerable; which makes it happen but rarely.

16. How tho' *acrimonious*, it takes away the sense of *Acrimony*.

17. How it causes *Madness*, and cures it by composing the Spirits, &c.

18. How it causes *Palsies* by relaxing the Parts, and making them susceptible of Humours, causing ill *Digestion*, &c. And may cure them (as Dr. Willis gives an *Instance*) by opening the Pores.

19. How it causes *Palsies*, and cures *Stupors*, &c. that proceed from Cold and Contracting Causes.

20. How it causes *Driness in the Mouth*, yet (by taking off *Fevers*) often cures it.

21. How it takes off *Hiccoughs*, and causes them, as it does *Vomiting*, and for the same Causes.

22. How it *stanches Blood* by quieting its motion, yet promotes the *Menses* and *Lochia* by relaxing, opening, and widening the Vessels and Pores.

23. How it stops *critical motions*, that depend upon Irritation and Contraction, and promotes such as depend upon opening the Pores.

24. How it revives People that are at the Point of Death for want of Opium, or by violent Contractions and Convulsions, and is fatal to other weak Persons.

25. How it causes *Convulsions* by its grieving *Rosin*, and cures them by quieting and composing the Spirits by pleasing them.

26. How it causes *Contraction* by the grievous Sensation that its *Rosin* causes, and *Relaxation* by the pleasant Sensation that its *Sal-Volatile.Oleosum* causes; by That it causes many ill Effects, not here named, and by This it cures them; for how can such contrary Causes (according as one or the other prevails) not cause contrary, and seemingly contradictory Effects at divers Times, and in divers Persons.

27. How

27. How it *relaxes*, yet *causes the Tension, Rigidity, and Erection of the Penis, Priapisms, &c.* by its *Titillation*.

Thus have you all, even the most mysterious and seemingly *Contradictory Effects of Opium*, explain'd and reconcil'd, and that so easily, that if there were no other *Proof* of the *Truth* of my *Foundation*, it is sufficient to convince any Man of its *Validity*, considering the *Vastness* of the *Number*, and *Perplexity* of the *Nature* of those *Effects*, that are all with such *Facility* explain'd, is able even to disparage the *Performance* as *mean* and *obvious*, (like that of the *Circulation of the Blood*, or *America* when found out) did not the *newness* of the *Thing*, the baffled *Endeavours* of all *Mankind*, and the seeming *Impossibility* of ever finding it out, (which was almost agreed upon) speak in its *behalf*. Consider, that nothing can be *plain* and *easy*, but what is *true*, and consequently nothing valuable but what is so; what's true *Knowledge*, but the *Knowledge of Things as they really are*? And when a *Thing* is known as really as it is, it must be *plain*, and never so till then; for to take a *Thing* to be what it is not, is all *Darkness, Errour, Puzzle, Confusion, and Vanity*, as all *Discourses of Opium* have hitherto been.

It is no *Wonder* then, that the *Cause of the Operation of Opium* grew more and more obscure, while they stated the *Cold Quality of very hot Opium*, the *Belching up of Vulcano's of Fumes from the Stomach to the Head*, (which have no *Existence*) their acting as a *Poison of the Animal Spirits*, their *fixing and coagulating them*, their *clogging them by Adherence*, or *clouding them*, their *wedging themselves among the Animal Spirits*, (none knows how) and thereby *disabling them*, their *stopping the Pores of the Brain*,

Brain, or compressing it, and thereby hindering the Generation of Animal Spirits, to be the Causes of the Noble and Pleasant Operation of Opium, without any Foundation in Nature, or the least Evidence of Sense or Reason, but vain Phantastical Imaginations form'd in the Chimera-Forges of their Wanton Brains, while they endeavour'd (Right or Wrong) to appear considerable Folks, by doing nothing to the Purpose in a kind of pretty, plausible, and imposing manner, thereby stuffing the unwary World with wrong and vain Conceptions and impertinent Prejudices, which are the greatest Obstacles of Knowledge.

I would fain know, which of those *Hypothesises* can tollerably solve I in *10 of the *Phænomena's* that I have enumerated, or, indeed, any one *Phænomenon* truly, mechanically, and demonstratively; yet are those *Whims* the glorious *Productions* of Thousands of years Studies, and solicitous *Disquisitions*; tho' every one that took *Opium*, actually felt the true Cause of its Operation, viz. The pleasing Delight that it occasioned, by affecting the *Membranes and Animal Spirits*, after the manner that I have at large set forth.

Good God! what blund'ring Groper is Mankind?
Who daily felt the Cause it ne're could find!
Tho' Thousands fought it with an eager Mind.

C H A P. XXIV.

Of Opium separated from its noxious Part,
(or Resin) and whether it is a Panacea,
&c.

THus far have I spoken of Crude Opium jointly with its Resin or noxious Part, now I will consider it separated from it, and shew how to do it. Galen says, That it is very difficult to find an excellent Remedy without a noxious Quality.

And it is as difficult to find any Thing so noxious, as not to afford a good Medicament; which you see in Vipers, Scorpions, Mercury, &c.

All, or most Physicians, unanimously agree, That Opium has such a noxious Quality, that causes Vomitings, Hiccoughs, Distresses, Anxieties, Convulsions, chiefly at or about the Region of the Stomach; and that if it were freed from it, it would be the noblest of Medicaments: Who can otherwise imagine? seeing it is so excellent and universal a Remedy, as it is now used in the World, without such an excellent Preparation thereof, wherein the noxious Principle is separated from it.

Of which Paracelsus says, That whoever shall enjoy it, will be a Professor of no less Knowledge than Apollo, Machaon, or Podalyrius, tho' he was the greatest Master of Arcanas, Panaceas, &c. yet does he confess, "That a Preparation of Opium stood him in stead, and perform'd his Business, when all his great Medicaments fail'd him; and that it will dissolve Difficulties, as Fire does Snow; or uses Words to the same Effect.

Helmont

Aden

Helmont, being in a kind of *Rapture*, upon Consideration of its Excellency, bursts out into this Exclamation ; *Happy is the Sick Man whose Physician knows how to separate the deadly (or noxious) Part from Opium !*

Platerus affirm'd, That he could with a Preparation of Opium preserve the broken Wheel of Life.

Etmuller says, That Opium may deservedly be esteem'd a general Remedy ; and the main End of his Tract, *De parvis Morborum Initiis*, is to shew how *Volatiles*, more especially *Salia-Volatilia-Oleosum*, (as that of Opium) may in small Quantities alter us, and cure our Diseases.

It were endless to tell you the Eulogies of the Learned concerning such a Preparation of Opium, which they generall conclude to be a most noble *Panacea* ; therefore many, and very solicitous have been the *Disquisitions* of the Ingenious and Industrious, to find out this heroick, generous, and most glorious Medicament. I am fully satisfied, that the pure *Sal-Volatile-Oleosum* of Opium, duely separated from its noxious *Rosin*, *Dross*, &c. is the very Thing ; some of the Reasons that convince me are as followeth, viz.

1. Because Opium has no other Principle in it, that signifies any Thing as to its laudable and noble Effects, but its *Sal-Volatile Oleosum* (as has been shewn.)
2. Because the *Sal-Volatile-Oleosum* of Opium produces all its good Effects.
3. Because the *Sal-Volatile-Oleosum* duely separated from its *Rosin*, and other Principles, produces no ill Effect in a moderate Dose.

This

of Opium Reveald. 257

This added to what has been Discourſed at large of the *Principles of Opium*, is (I think) ſufficient to ſatisſie any Man, that the *Sal Volatile-Oleoſum of Opium* (ſo ſeparated) is the great *Panacea* that is ſought for.

However, becauſe we are upon the *greateſt Thing* in *Phyſick*, (as may be well inferr'd from what has been already ſaid) and that the *World* has been under great *Fears*, *Jealouſies*, and *Blindneſs*, concerning this *Matter*, and the *Uſe of Opium*; it will be well worth our While to give all imaginable *Satisfaction* in this Caſe, therefore I will,

First, Lay down all the requiſite *Qualifications* of a *Compleat Panacea*, as far as I can collect out of the moſt Eminent *Authors*, and my own *Conſideration* thereof.

Secondly, I will particularly enquire as to each of the *Qualifications*, whether the *Sal Volatile-Oleoſum of Opium*, duely ſeparated from every other *Principle of Opium*, is furniſhed therewith?

Thirdly, I will ſhew you how duely to ſeparate its *Droſs*, *Roſin*, &c. ſo as to leave a pure, ſincere *Sal Volatile-Oleoſum of Opium* for *Uſe*.

The requiſite *Qualifications of a Panacea* are theſe, viz.

1. That it ſhould highly pleaſe our *Senſation at Stomach*; becauſe the *Stomach* is contriv'd and appointed by *God* and *Nature*, as the *Touchſtone* to try, a *Sentinel* truly to inform, and a *Critical Judge* to determine, what is, or is not agreeable to our *Nature* in general, and therefore (as has been ſhewn) endued with a wonderful *sagacity* and *nicety of Senſation* for that *End*. It follows
S then,

then, that a *Panacea* should be very pleasing and agreeable to the *Stomach*, and therefore very cordial.

2. That it should be highly pleasing to the sensitive Soul, which is the Principle of all Motion, Action, and Alteration in an Animal; This *Helmont* couches under the Name of pleasing the *Archæus*.

3. That it should take away all Grievances of the sensitive Soul (or *Archæus*) because its Grievance is the Essential Form of Diseases, for even Morbid Matter, unless it causes a Grievance, causes no more Disease than it does in a dead Carcass, as *Helmont* and common Reason assures us; therefore Disease and Grievance are only Two Words signifying the same Thing, and nothing is capable of Grievance in an Animal, as such, but the sensitive Soul.

4. It should compose; comfort, enliven, encourage, and invigorate our sensitive Soul and Spirits, as being the Principles of Motion in our Animal Nature, in order to self Preservation; for Nature (or those active Principles within us) is the Curer of Diseases, and we Physicians only its Ministers to offer it good Means, &c.

5. The Principles of a *Panacea* should be agreeable to the best, noblest, most active, and predominant Principles of our Bodies.

6. Those Principles in the *Panacea* should be more vigorous than ours, to reduce them, when deficient, and exalt them, when depressed, clog'd, &c.

7. It should be a general Resolver of Humours, for which Cause the *Liquor Alcahest* is so much extolled for a *Panacea*. Hear what the great Physician *Claudius de la Courvee* says, *Uni morbosæ, & semper preter Naturam humorum coagulationi, unique eorundem colliquationi, cui perpetuo intendit natura, diligenter studeas; hujus adjuvandæ, illius corrigendæ modum si affecutus fueris, habebis in Praxi secretum omni*

omni auro potabili, omnique Antidoto prestantius; denique plus poteris in Praxi, quam si cursus Astrorum, Metallorum vires, aut totam callueris panaceam.

8. It should; after such Resolution of Humours, compose, concentrate, combine, and unite the good Principles.

9. It should discuss the bad and useless Parts.

10. It should open the Pores to give them their Exit; by that most universal, natural, plentiful, kindly, and easie Evacuation.

11. That (after all) it should (like the Liqueur Alcabest) remain very much unaltered in it self.

Now whatsoever is endued with these Eleven most noble Qualifications, must be in the Estimation of any Rational Physician or Philosopher, a glorious Panacea, that is fitted to take off the Matter and Form of all Diseases, (or Grievances) as far as it is in the Power of a Natural Medicament (or Alterative) so to do; Therefore, let us see, how the pure *Sal.Volatile-Oleosum* of Opium is furnished therewith?

I. It is so highly agreeable and pleasing to our most nice Sensation at Stomach, which is given us for a Touchstone, Watch, and Judge of what is agreeable and beneficial to our Bodies, that nothing in the whole World is so agreeable and pleasing to it, and therefore nothing is more agreeable and beneficial to our Animal Nature; it would imply a Contradiction, that the Stomach, which is given us (and accordingly qualified) to make a true Report of what is, or is not agreeable and beneficial to us, should always (tho' it may by Accident possibly) give us a false Report of the Agreeableness of Things; It would be more than Prophaneness to attribute such deceitful, unkind, and unwise Contrivances to the infinitely Good and Wise; therefore

the *Stomach* does infallibly testify, and assure us, that it is most agreeable to our *Nature*, seeing it is always so to it; *Agreeableness* and *Disagreeableness* with which, is appointed and ordain'd by God and *Nature* to be the *Test* and *Touchstone* of what is agreeable or otherwise to our *Animal Nature*.

Obj. Why then, being so agreeable to the *Stomach*, should it not create an *Appetite*, but rather lessen it?

Ans. Tho' some may be so weak as to make such an *Objection*, because Things agreeable to the *Stomach* are commonly reputed to cause an *Appetite*, yet (the Matter duely considered) the Case is quite contrary; for *Appetite* (or *Hunger*) is a *grievous Sensation* at *Stomach*, which cannot be expected from Things that gratifie and please the *Stomach*, which are the adequate Cure of a *grievous Sensation* (or *Hunger*;) Thus *Meat* and *Drink* (as has been shewn) cure an *Appetite*, *grievous Sensation*, or *Hunger*; Thus *Wine* and *Opium* do (by pleasing the *Stomach*) cure a *canine Appetite*, &c. Therefore you may Note by the by, that all *Meat* and *Drink* that please the *Stomach*, and gratifie its *Sense*, are really *Opiates* in some degree, causing good Humour, Sleepiness, &c.

Appetite or *Hunger*, tho' it is a convenient Call or Intimation of Want of Supply and Recruit, is, as such, a consequent of defect, and so unnatural, tho' call'd *Natural*, because it is a Thing that happens of course, to direct us how to proportion Things to the Exigence of *Nature*; of which there wou'd be no need, if we could otherwise proportion good and agreeable *Refectio*n to our *Wants* thereof: In short, it is a *Disease* which
Thing

Things agreeable and pleasing to the *Stomach*, as our *Panacea*, must cure, or else it would not be a *Panacea*; and (as was shewn) nothing can be a more proper Cure of *Grievance* (or *Displeasure*) than *Pleasure*; Therefore what is agreeable to our *Stomach*, and consequently to our *Body*, must cure not cause *Appetite*, as *Meat* and *Drink*, &c.

Obj. But it may be said, That *Appetite* argues a good *Digestion*, which is good for the *Body*.

Ans. It does indeed argue a quick *Digestion*, and great Expence of the *Recruits* taken in, but still it is all bottom'd upon *Deficiency*; and *Digestion* may be, and is very often too quick, as in the *Boulimia*, (or *canine Appetite*) Nature delights in a gentle, kind, and gradual *Dissolution* of the *Meat* at *Stomach*; to which you'll find, by and by, that *Opium* very much conduces by its resolving *Quality*.

2. Nothing in Nature is more pleasing to the sensitive Soul, as appears by the whole Series of our Discourse, and the explaining all the Phenomena or good Effects of *Opium* by that very Pleasure of the sensitive Soul. Therefore,

3. It (as was manifestly shewn) does thereby take off all Grievances, which are the essential Forms of Diseases; and the essential Forms of Diseases being taken away, (which give them being, and make them to be what they are, according to the Definition of an essential Form) the very being of Diseases must be taken away: Therefore our *Sal-Volatile-Oleosum* is a compleat *Panacea*, that takes away the Essence or Being of Diseases, in taking away the Grievance thereof.

Here it may be said, that the Matter of the Distemper remains, and consequently a *Disposition* to a *Relapse* as soon as the *Sal-Volatile-Oleosum* has ended its Operation.

But what need it end at all, if you please? It may be renewed without *Danger* (for this is not as *resinous Opium*) till the Matter is subdued thereby, which it will also do, as appears more manifestly by the following *Qualifications*. For (as has been shewn)

4. It composes, comforts, enlivens, encourages, invigorates, and causes a great Euphory of the sensitive Soul and Spirits, which are our Natural active Principles of Motion, by which all ill Matter is effectively subdued when they act with Alacrity and Vigour, they being the Principal Agents, and we Physicians but (as was said) Ministers, or as Handmaids, to offer or hand good Matter, Medicaments, or Instruments, to those Principal Agents of Nature; and that this *Sal-Volatile-Oleosum* of Opium is the most proper Matter or Medicament we can put into Nature's Hands so invigorated, appears manifestly in that,

5. Its Principles are the most agreeable to the best, noblest, most active, and predominant Principles of our Bodies, as has been proved most evidently plene & plane, nor is it only agreeable; but,

6. More vigorous and powerful to actuate, reduce, alter, or exalt our Principles, according to the Direction of our invigorated Nature, (or sensitive Soul and Spirits) which having so convenient an Instrument, and highly qualified a Matter, will soon alter the perverse, renew the decayed, acuate the dull, and elevate the depressed, effete, and pall'd Humours of our Bodies, especially seeing,

7. That

7. That the *Sal-Volatile-Oleosum* of Opium being so agreeable and powerful, must be the greatest Resolver of Humours that can be imagined; for all Resolution is by an Agreement of Particles, which makes them easily miscible, insinuate into, and penetrate each other, especially if one be somewhat more vigorous and penetrating than the other, as the *Sal-Volatile-Oleosum* has been plain'y proved to be; Thus it is, that all *Menstruums* do so resolve things of their own Nature, and so purifie and cleanse them, by taking to themselves what is meerly and purely of the same Nature, and rejecting or letting go their Hold of what is otherwise: Where it is worth noting, how upon the Account of the intimate Combination and Union of the *Volatile Salt* and *Oily Parts* in our *Panacea*, it is dissolvable in all *Menstruums*, and consequently an *universal Resolver* of all the Humours of our Bodies, which its *external resolving* of all Humours and Tumours does also prove. Now if it be such a Resolver, of which there is no Place to doubt, then as *Claudius de la Courvee* says, it must excell all Things in altering and reducing all the Humours of our Bodies to a good and agreeable Condition. Nor does it only thus resolve them, and thereby separate (as was said) the good from the bad, but,

8. (When it has so done) it, by the amicable Agreeableness of its *Sal-Volatile-Oleosum*, composing Faculty, strict Combination of its Principles, joins to; concentrates, congregates, and (as it were) cements the best and most agreeable into a close Union and firm Texture, by (as was said) the Direction of invigorated Nature, which is of it self (the good being once separated from the bad) highly sufficient (without any other Help) to unite Parts so agreeable, and of themselves inclined to unite and combine, tho' all the Parts of *Opium* (like those of

the great *Dissolvent*) were gone ; and when that is done,

9. *The high discussive Quality of the Sal-Volatile-Oleolum must be very effectual for the Diffusion and Discussion of the sever'd effete Particles, which must be highly assisted and improved by the brisk and chearful Motions of Nature, (viz. the sensitive Soul and Spirits) so (as is aforesaid) invigorated ; Nor is this all, but to compleat and perfect the Operation,*

10. *It lays open all the Pores of the Body (as has been Demonstrated) to let them out, and give the ill Particles their final Exit, by the most natural and plentiful Way of Evacuation, leaving the Body free from all Miasms and Impurities.*

11. *I have sufficiently shewn how unalterable it is in it self, Chap. 15. so that like the Liquor Alcahest it is not made to be subdued, but to subdue and resolve Humours.*

Now, what can be required more in a *Medicament*, and how can the *sensitive Soul and Spirits*, (or *Nature*) so invigorated, and endued with all *Euphory* and *Chearfulness* by this glorious *Medicament*, whose *Principles* are not only agreeable to our noblest ones, but more powerful and intimately combin'd, so resolving of *Humours*, ready to unite the good, and to discuss the bad, and carry them off by the *Pores*, ever fail (being duly administer'd) of good Effect in altering all the *Humours* of our Bodies ?

Hippocrates, in his *Book De Naturâ Hominis*, states the Cause of Diseases to be a *Disgregation of Humours*, by which he seems to imply, that the Power of congregating and concentrating of *Humours*, were sufficient to accomplish a *Panacea* ; which is but one single Qualification in eleven of our

our *Sal-Volatile-Oleosum*, tho' this alone (as is experienced even in common Preparations of *Opium*) suffices very often to cure Diseases by composing Commotions, as in *Diary Fevers* from *Perturbations*, &c.

Thus the bitter and firm textured *Cortex* (as I have shewn in my *Book De Febris intermitten-tibus*) takes off *Ague Fits*, by re-combining the segregated *Humours* with the *Bloud*, which it suddenly doing, leaves a *Disposition* in the *Bloud*, when ever it meets with a segregating Cause, (as *Purging*, *violent Motion*, *Insolation*, *intemperate Drinking*, &c.) to a *Relapse*, by a second Separation of the *Morbid Matter* from it, as you have it more at large in my said *Book*, p. 166, 167, &c. 242, 243, &c. where you may see how *Opiates* conduce very much to a speedy Cure by the *Cortex*, by composing, &c. *Martianus* says, *Comm. de locis in Homine*, p. 76. *Opium sistit & prohibet humorum Disgregationem*; That is, *Opium* hinders *Disgregation* of *Humours*.

Now you may perceive the true *Qualifications* of a *Sal-Volatile-Oleosum*, so much sought for by the *Learned* as a *Panacea*; and how far the common ones, that are sold in the *Apothecaries Shops*, are from being such.

Sylvius (indeed) had an excellent one, with which he did many, and great *Cures*, which being considered, (had he not confessed his *Ignorance* of the Cause of the Effects of *Opium*) and the Narrative he makes of its *Vertue* and *Performance* in his *Preface* to the first *Book* of his *Praxis*, and that he delighted so much in the *Use* of *Opium*, even when he was young, that he was call'd by the Name of *Doctor Opiatus*, and that he declares no *Oil* was added in its Preparation,

ration, and that it is intimated that the *Oil* and *Volatile Parts* were strictly combined, would have made me suspect, that it was the *Sal-Volatile-Oleosum* of *Opium* that he used, which if it was not, I dare be confident, that (notwithstanding all its Excellency) it was not as good.

I am very well satisfied, that a true and consummate *Sal-Volatile-Oleosum* is not to be made barely by *Art*; Enquirers might have better success if they sought it among the Natural Tribe of bitter Plants that are agreeable to the *Stomach*, which have all in them a *Sal-Volatile-Oleosum*, but how to pick and cull is (I think) best seen by the requisite *Qualifications* of a *Panacea* that I have stated. There have been many in whose Hands *bitter Things* have been as a *Panacea*. One in Germany cured most Diseases with *Wild Sage*. Some have done great Things with *Agrimony*, others with *Bean Trefoil*, some with *Centaury*, others with *Gentian*, &c. and the famous Dr. *Lower's* Practice ran almost altogether upon bitter Things, which did him great Service in his *Tincture* of Steel, (as he call'd it) that he often made in *Destill'd Waters*, that could take little or nothing to Purpose of the *Tincture* of Steel, (whether out of Ignorance or Design, I will not, tho' I may determine) which shews, that it was the bitter Things that did the good, and made it as a *Panacea*, and not the Steel.

However, certain it is, that promoting the *Dissolution* of Meat at *Stomach*, which the bitter *Salia-Volatalia-Oleosum* do, is a great Foundation for Cure; and (no doubt) our *Sal-Volatile-Oleosum* does, by its *inciding, dividing, and resolving Quality*, contribute very much to a due solution thereof at *Stomach* by *Connaturalness*, as all *Menstruums* do,

do, (especially if it be *Flesh*, which we use mostly, and requires most help to be resolv'd) which may very well be, tho' it lessens *Appetite* by pleasing *Sensation*; for (as was shewn) it is quite another Thing to cause *Appetite*, (or a *grievous Sensation*) and *Resolution* (or *Digestion*) of the Meat at *Stomach*; for Wine helps *Digestion*, yet, by the pleasing *Sensation* that it causes at *Stomach*, it cures a *canine Appetite*, and at any time (if you'll observe it) takes off the *Eagerness* of *Appetite* for the present; you can better stay without Meat after a *Whet* before Dinner, than you could without it; so that the Wine answers that of a *Whet* as to *Digestion*, tho' not to *Appetite* or *Hunger*, which is a *grievous Sensation* that Wine must rather Cure than Cause.

It is true, that *Wine* or *Opium* may, by causing a sense of *Pleasure* at *Stomach*, cause some stay of the Meat at *Stomach*, but it does not thence follow but the *Digestion* may be the truer, because more gentle and gradual, as it may, and does happen in *Sleep*, when Things that are not very hard of *Digestion* are eaten, which are not good at any *Time*.

You may remember how *Blisters* (to which *Opium* is near of Kind, as has been shewn) do quickly by their *resolving Nature*, turn the *Cuticle* (as if digested) into a sort of *Gelly*; what a mighty Help would such a Degree of *Resolution* be to the *Digestion* at *Stomach*, when it is, by that Means, like the Skin of a well boil'd Cow-heel, half turn'd to a *Gelly*, and from a Thing that is very hard of *Digestion*, to be very easie, as is also a Boar's Skin in *Brawn* by reason of the prior *Resolution* in the Boiling.

If (as *Sanctorius* says) *insensible Perspiration* hinder'd is the Cause of most Diseases, what is more proper to Prevent or Cure them than this *Sal-Volatile-Oleosum*, which causes *Perspiration* above all Things?

I have been lately inform'd, That in some Parts of the most Eastern Countries, they Use *Opium* as a general Medicament or *Panacea*.

Dr. Willis and *Sylvius* say, it hinders the Coagulation of the *Bloud*; how many *Chronical Diseases* may it then Prevent or Cure? That is the great Effect of the *Alcabest*, and that is it that mainly qualifies a Medicament for a *Panacea*, as *Courvee* asserts, and all Ingenious Men allow.

Wedelius says, That it happily restores the Tone of the *Bloud*; What is then wanting to the Preservation of Health?

Paracelsus says, That *Tam homini quam Morbo somnum conciliat*; That is, That it puts the Disease asleep, as well as the Man.

✿ *Platerius* cured the Gout with it safely, quickly, and pleasantly, and I know one that can do it, especially if it be at the first coming of the Fit.

Willis gives an Instance of one perfectly cured of a Dropsie and Pocky Pains by the Use of *Laudanum*.

✿ *Horstius* perfectly cured an *Hypochondriacal Person*, that was troubled with *Stupidity*, *Watchings*, *Loss of Appetite*, *Trembling*, and direful *Epileptical Convulsions*, and past all Hopes, by the Use of *Opiates*. I

of Opium Reveal'd. 269

I my self have often seen *Defluxions* and *Catarrhs* cured by the use of *Opiates*, and one of an inveterate ill Habit of Body of many years standing.

Wedelius says, That it resolves the *Grunnescence* of the *Bloud*, alters and dissipates the tenuious Parts of it, tempers the acrimonious, &c.

The *Ancients* used it against *Agues* with great success.

You may (to confirm this Matter farther) observe, that among the constant and frequent Effects of *Opium*, there is no bad ones, unless there be 2 or 3 purely upon the Account of its *Rosin*, (as has been shewn) therefore when it is separated from it there is no Cause to fear the Use of the *Sal-Volatile-Oleosum*, unless it be (as in the Case of *Wine*.) when 'tis taken in an *excessive Dose*, or used *too long* in a lavish intemperate manner; so that when I have shewn how duely to prepare it, and the moderate and safe *Doses* thereof, it may be used altogether as safely as *Wine* in a proportionable *Dose*; for what Harm can there be in moderately pleasing the *Membranes*, particularly at *Stomach*? which all the best Things we use, as *Wine*, *Cordials*, *Meat*, and *Drink*, do, (which are therefore all *Opiates* in some degree) thereby assuring us of their *Goodness* and *Agreeableness* to our *Bodies*, tho' they do it not in so high a degree as our *Sal-Volatile-Oleosum* does, which is the more *Authentick Certificate* of its Excellency; tho' it is to be still confessed, that *Excess* of the best Things, as *Joy*, *Comfort*, *Pleasure*, *Wine*, *Cordials*, &c. have, and may do mischief; but what need *Excess* therein, any more than in *Wine*, *Meat*, *Cordials*, &c. which then (like it) are all inconvenient and injurious to the Body.

All

All this I have said to administer Cause to improve the *Practice* of Physick by the *Use* of this *Panacea*, (now that it is known) by introducing its noble *Use* as an *Alterative* to Cure, as well as formerly to palliate *Diseases*, it being a far more beneficial Thing to Cure than palliate.

Remember how the *Cortex*, *Mercury*, *Antimony*, and other the most effectual and glorious *Medicaments* have been traduced, and scandalized by the ignorant *Imaginations* of the Unlearned, who having no true *Knowledge* of the *Vertue* of Things, wholly depend upon *Fears* and *Jealousies* to guard them from their imagined ill *Effects*, which (generally speaking) only the same *Ignorance*, *Fears*, and *Jealousies*, gave a *Phantastical Being* to.

It remains, that I in the next Place shew you;

1. *The true Preparation of this Panacea or Sal-Volatile-Oleosum.*
2. *Other Preparations of Opium that are next it in Safety and good Effect, and why they are so.*
3. *The moderate and truly safe Dosing of them all, there being no Danger in well prepared Opium, but from Excess in the Use thereof.*

C H A P. XXV.

Of the Preparation of the Panacea, or true Sal-Volatile-Oleosum of Opium.

SEeing that the *Sal-Volatile-Oleosum* of Opium must be such an effectual, generous, and general *Medicament*, that is both *cordial* and *alterative* in so transcendent a manner, it well deserves a careful and curious *Preparation*; therefore I will be very particular therein. To that end,

1. It must be separated from all the noxious *Rosin*, and all *Filth* and *Dross* of the Opium.

2. It must be kept entire without weakening, or any way altering it, or adding a new *Quality* thereto. Therefore,

I. Opium must not be torrefied, according to the *Common Practice*; 1. Because the finest and most volatile Part (which is the very best) is thereby lost. 2. Because the resinous and earthy Parts (which are not spent that way) grow more in Proportion to the *Sal-Volatile-Oleosum*; so that torrefying cannot be allow'd, unless preserving the *Bad*, and destroying the *Good*, be allowable. The vain and ostentatious Pretence of destroying (I know not what) *narcotick Sulphur*, (which is a Nick-name given by Ignorance to the best Parts of Opium) is most insufferable stuff. 3. Because all *Empyreum* (which renders it very nauseous) can hardly be avoided in torrefying it; but suppose it were, What need is there otherwise so to damnify it? (as is aforesaid.)

Obj.

Obj. It is found to be more innocent, after such *Torrefaction*.

Ans. I grant that it happens so sometimes; but it must be merely by *Accident*; either, 1. Because it meets with a strong *Digestion* at *Stomach*; Or, 2. By the Custom of poudering it, which is always directed, and done after the *Torrefaction*; by which means the *resinous Parts* being divided and severed, become less liable to a *Coalescence* at *Stomach*, and consequently less offensive and more subduable: Especially, 3. When it is mixed (as generally it is) with other things that keep the *Parts* of the *Rosin* from *Coalescence*, and leave them more conquerable by the *Digestion*, as the *Ancients* found by *Experience*; who therefore did generally, if not always, mix it in a small quantity, with many other things in great quantity, in the form of *Electuaries*, as in *Venice-Treacle*, *Mithridate*, &c. though nothing in them corrected the *Opium* otherwise than by dividing and segregating its *Parts*. This indeed is like that of *divide & impera*; or interlining suspected Soldiers with trusty, or friendly ones, to prevent a mischievous *Conspiracy*: But how much better is it to have no Enemy to contest with, by a due and compleat separation of the *Rosin* from the *Opium*! Otherwise you must be obliged to good Accidents, if ever torrefied *Opium* becomes safe, because all the *noxious Rosin* is left in it.

Therefore if after *Torrefaction* you will give it in a Mass, without poudering it, and mixing it with other things, you'll find its ill *Effects* to be as bad, if not worse, than ever; as you will also, if you afterward extract it out of *Spirit of Wine*, reducing it into the *Form* of *Pills*, by which means
the

the severed Parts of the powdered Rosin do again coalesce into a lumpy Condition, which renders it worse than crude Opium, as Wedelius, my self, and others do testify; because the Opium being somewhat weakened, and all the Rosin remaining, the Dose of the Opium, and consequently of its Rosin, must be increased. As, suppose 8 Grains of crude Opium has 2 of Rosin, 2 of other Dross, 2 of Phlegm, and 2 of Sal-Volatile-Oleosum; and that 2 Grains of the crude Opium containing half a Grain of the Sal-Volatile-Oleosum, was the Dose; then if in torrefying it, one Grain of the Sal-Volatile-Oleosum be lost, and another of the Phlegm, there will remain only 6 Grains of the Opium, with the Virtue of one Grain of the Sal-Volatile-Oleosum in it; therefore 3 Grains of it must be now used, to have half a Grain of the Sal-Volatile-Oleosum, which 3 Grains will contain half the Rosin of the whole Mass, that is, one Grain; whereas there was but half a Grain thereof in the 2 Grains of crude Opium: Therefore torrefied Opium is in it self much worse than crude Opium.

And it is yet worse, if after Torrefication you make an Extract of it in Spirit of Wine; for then the Dross and Phlegm being separated from the 6 Grains, nothing will remain in the Extract but the resinous Part, with less of the Virtue of the Sal-Volatile-Oleosum, which is not taken up so greedily, as the Rosin is, by the Spirit of Wine; besides that, some of this Volatile Part may be lost, and that the Rosin is now more compacted, as not having as much as the drossie, earthy, or watry Parts to sever and keep its noxious Particles at a distance, to render them (as was shewn) more subduable and digestible at Stomach. See what Pains the inconsiderate World does take (and exceedingly best of) to render Opium by Torrefaction, Ex-

traction in Spirit of Wine, &c. at least twice as noxious as crude Opium, without accounting how far the Sal-Volatile-Oleosum that remains is impair'd by the Fire and Spirit of Wine! It is therefore no Wonder that Wedelius declares, That he found more Mischief by such Extracts out of Spirit of Wine, than any other Preparation of Opium. It is plain then,

II. That we must not extract it out of Spirit of Wine, or any such sulphureous Menstruum; 1. Because more apt to extract the Rosin than the Sal-Volatile-Oleosum. 2. Because the Rosin will be more compacted. 3. Because the Spirit of Wine may in some measure alter it.

III. We must not extract Opium first out of Water; and afterward out of Spirit of Wine, and then mix them together, and evaporate them to an Extract: For this is (as was said) wisely taking care to add the Poison to the Panacea, or Rosin extracted by the Spirit of Wine, to the Sal-Volatile-Oleosum extracted by the Water; besides the Impair and Loss made of the Sal-Volatile-Oleosum by the Spirit of Wine, and the Evaporation, how gentle soever it be.

Here it will be seasonable to note, That there is a general great Fault committed by Preparers of Medicaments, especially such as pretend to most Curiosity therein, in endeavouring (right or wrong) to have all the Principles of the Plant, &c. join'd together in their Medicaments, however noxious or contrary to the Purpose, (as you see in the Instance just now mentioned) whereas they had much better do as the great Helmont says, Pharm. & Dispens. Modern. 12. "*Sanguinem a cruore, & Parenchymale Plantarum distinguere, & separare discant Tyrones,*"

“*si quicquam laude dignum per simplicia egisse mediten-*
 “*tur.* That is, “Let Beginners learn to distinguish
 “and separate the true Bloud of Plants from their
 “Cruor (or dead Gore) and Parenchyma; if they
 “think to do any thing Praise-worthy by Simples.
 You’ll find this to be very pat in the true Prepa-
 ration of the *Sal-Volatile-Oleosum*, whose Ruby-colour
 makes it look like Bloud, while the Rosin, Earth,
 and Dross, make the Appearance of a dull and
 dead Cruor, (or Gore.)

If they took a Tincture of Opium in Spirit of Wine, and used it so, it would not be so bad; for then the resinous Particles are disseminated, and not so liable to Coalescence at Stomach; but so great is the Stupidity, that they take care, by reducing it into the Form of an Extract, to combine them and make them as noxious as is possible; and then they think them worthy to be boasted of as their Nostrums, proclaiming their Ignorance, and glorying in their greatest Shame and Disgrace of Mankind, that Humane Species should have any such unthinking Brutes in it.

IV. We must not use Acids in the Preparation thereof; 1. Because being in their Nature opposite to Volatile Salts, it cannot be done without Injury to the *Sal-Volatile-Oleosum* of Opium. 2. Because they cannot so well agree with the oily Parts of it. Yet are they not so much to be blamed as Extracts made in Spirit of Wine, or sulphureous Menstruums; because acid Menstruums leave the Rosin behind them untouched, or not extracted.

V. A Salino-Volatile Menstruum, as Spirit of Sal Ammoniac, of Urine, &c. is not so proper: 1. It may render the *Sal-Volatile-Oleosum* of Opium too acrimonious. 2. Because by its Volatility, Acri-

mony, &c. it may cause too great a stir in the Blood, &c. and so oppose or hinder Sleep, which is one of the most happy and useful Effects of Opium, (or its *Sal-Volatile-Oleosum*.) 3. Because it may have undue Effects by altering its general Disposition: Nay,

VI. *We are not to use a lixivial Menstruum*, (tho' so much cried up) 1. Because it extracts the resinous Parts, which (*experto crede Roberto*) I have found to be pernicious upon that account, like Extracts in Spirit of Wine, unless great care be taken to separate those Parts (which is not easily done) by Filtrations, &c. 2. Because being very apt to join with the oily Parts, and quite to destroy their Nature, by converting it into a kind of Sapo; it may deal so with some of the oily Parts of the *Sal-Volatile-Oleosum* of Opium. 3. Because there is no need to run any of these Hazards, since the *Sal-Volatile-Oleosum* may be (as I shall shew) easily extracted in its Purity, without those Troubles and Dangers. 4. Because any Tincture made thus is apt to let go the Rosin at Stomach, if it be diluted with aqueous Moisture taken before, with it, or after it; which so being let go, coalesces, and does mischief.

VII. *The use of Fire* any way (besides that of its Torrefaction) is much to be suspected: 1. Because the *Sal-Volatile-Oleosum* may be in some measure thereby evaporated: Or, 2. An *Empyrum* contracted: And, 3. The Rosin (as was said of its Torrefaction) grows the more in Proportion, if any of the *Sal-Volatile-Oleosum*, or but the Phlegm be (by that means) evaporated, and the Remainder kept for use. And particularly,

VIII. The Distillation thereof may cause mighty Alterations in its Properties, Strength, &c.

We

We must therefore avoid all these *Ways* of preparing it, and yet must we,

1. *Separate the Sal-Volatile-Oleosum of Opium from all its Resin, Earth, Filth, and Droß.*
2. *No way weaken it, alter it, or add new Qualities thereto, but preserve this most Noble and Inestimable Medicament in its Purity and Sincerity.*

To this end *Rain-water distill'd*, used cold, answers all Intents : For,

1. It readily imbibes the *Sal-Volatile-Oleosum* of *Opium*, without *Fire, Heat, lixivial Salts*, as *Salt of Tartar, &c.*
2. It imbibes none of the *Resin* of the *Opium*, but lets it all subside together with the earthy and droßie Parts, separating the lighter *Filth* (if there be any) to the *surface*.
3. It no way weakens, alters, or adds any new *Quality* to the *Sal-Volatile-Oleosum*.
4. Whatever cold *Water* dissolves, which is the *General Drink*, or *Menstruum*, appointed by the *All-wise Creator* for the *Dissolution* of all Things taken into the *Stomach* of *Animals*, is easily dissolved at *Stomach* by its more powerful and agreeable *Menstruum*. And not only so, but,
5. *Water* it self is a mighty *Stomachick*, and *Causer of Digestion*, as *Hippocrates* positively declares, *L. 6. Epidem. Sect. 4.* But there's no need of quoting *Hippocrates* in so notorious a thing, daily *Experience* tells us the same: Do not all *Animals*, by its Help, digest their Food? Do not all *Mineral Waters* (scarce any excepted) create an *Appetite*, and cause *Digestion*, even when no such *Effect* can be attributed to the *Mineral* they contain? Than which they do also (as

may be very easily proved) more good (generally speaking) ἀγιστον ὑπὸ ὧν ; for which, and many more *Reasons*, it is great *Neglect* and *Folly*, that it is not more used for *Extracts*, &c. for then they readily dissolve at *Stomach*, and thereby sweetly and speedily take *Effect*, giving it the least *Labour* and *Disturbance* that may be, as is experimentally found in that of *Aloes*, *Scammony*, *Briony*, *Hellebor*, *Agaric*, *Rhubarb*, *Coloquintida*, *Sena*, and what not? unless the *Vertue* lies in the *resinous Parts*; for then *sulphureous* or *lixivial Menstruums* are convenient. How inconvenient are they then, when the *Evil* or *Mischief* lies therein, as in our case!

6. It is not to be doubted, but *Water* generally imbibes what is best and most agreeable to our *Bodies*, it being the general *Menstruum* appointed by *Wisdom* it self for that *Use*, and to be the *Vehicle* of what is best in all our *Food*, &c. to the *Bloud*: However, there can be no doubt of (what mainly concerns us at present) its most ready dissolving our *Panacea* in the *Stomach*, that does it out of it, when cold, without the convenient digestive *Heat* and powerful *Menstruum* that it finds there. Therefore,

Take of distilled Rain-water 24 Ounces, of choice Opium sliced thin 8 Ounces; put them together in a strong Glass Vessel of Bottle-metal, that contains about 3 Pints; let it be of a tall Figure, with a Mouth that conveniently receives a Cork, (a large Glass Bottle may serve the turn;) cork it so as the Cork may be easily taken out, shaking it 3 or 4 times a day for 6 days, and keeping it in a place free from Frosts, or any very sensible degree of Heat: Which being performed, lay the Vessel side-long for 24 hours longer, and afterward decant and filtre your Tincture, (which will be of a Ruby colour) and put it into a Glass
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Bottle of such a Bigness as that it may fill it within a small matter of the Cork; and so let it stand for 3 or 4 days; then pour off some of the surface of it, and instead thereof, put sweet Oil thereon: Let the Vessel have a convenient Duct, or Pipe, in the bottom thereof, to empty it out upon occasion. This I call the Liquid Panacea of Opium.

To the Fæces add a Pint of cold distill'd Water, shaking the Vessel (as before) 3 or 4 times in the day; let it stand on it 24 hours, and in the morning decant it into another Vessel; repeat the same quantity of distill'd Rain-water, till the Opium no longer tinges it, or very inconsiderably in 24 hours: At last you may use Water kept hot by a Fire, &c. the better to extract the remaining Sal-Volatile-Oleum. Evaporate all these last Waters in Balneo to the consistence of an Extract. This I call the Solid Panacea of Opium.

GOD and Nature act by simple Means; and nothing (in imitation of Them) is more commendable in a Medicament than Simplicity; therefore I shall add nothing to the Panacea's, but wholly leave that to other Physicians to please themselves or Patients, by adding Ambergrise, Musk, Saffron, Oil of Cinnamon, or other chymical Oils, Sugar, or the like, according to their Intent.

I have observed, That (as Reason tells us) its Smell is best palliated by other rank Smells, as that of Onions, Garlick, Asa-fætida; &c. and its bitter Taste with bitter things, as Gentian, Centaury, &c. Therefore when Persons that know its Smell and Taste are averse to take it, (if the other more acceptable Things will not suffice for that purpose) use some of these; You may, when you are in haste, infuse half a dozen slices of Gentian-root,

and one slice of an *Onion*, or a bruised *Cloue of Garlick*, or both, in a *Glaß of Wine*, for one *hour* for a *Vehicle* in that case: 'Twere better to infuse them longer, if you have time; but you'll find, that the *liquid Panacea* has not such a mighty rank Taste, or Smell, but that it is easily palliated by such means, if the *Opium* had no *Empyreum*. The *solid Panacea* may be also palliated by the same Things, conveniently mixed therewith.

I know there are other *Ways and Means* to separate the *Rosin*, &c. as extracting a *Tincture of Opium* in *Spirit of Wine*, and afterward precipitating the *Rosin* with distilled *Rain-water*; but this is attended with more *Trouble* and many *Inconveniencies*, that are avoided by the *cold distilled Rain-water*: For, 1. You know not how the *Spirit of Wine* may (as was said) alter it. 2. This is going round the *Bush*, and compounding two *Menstruums* together, whereas the simple *Water* used alone is much better. 3. You cannot thus separate the resinous *Particles* so perfectly, by reason that the *Spirit of Wine* must retain some of them; and if you add more and more *Water* in the *Precipitation*, the *Tincture* becomes too much diluted, and very weak: How much better is it to use a *Menstruum* that never takes up any *Rosin*, and consequently needs no such *Separation* and *Labour of Precipitation*! It is better not to admit an *Enemy* to one's Country, than afterward to endeavour his *Expulsion*; for he will at best leave some Marks of his *Hostility* behind him, as the *Rosin* will in the *Spirit of Wine*.

The like *Inconveniences* there will be in separating it by the way of *Distillation*; as, 1. The altering of it by the Tyranny of Fire. 2. The loss of it by *Evaporation*. 3. The addition of the Particles of Fire thereto. 4. The never separating it so well that way. 5. The disuniting of the Oil and *Volatile Salt* in some measure. But what Experience may hereafter teach Men, I will not determine, neither can I.

But this I can, That as it was even *miraculous*, that People should never mind the Cause they daily felt, and solicitously sought for; so it is as strange that they could not hit upon the plain Use of Water (so very common in all Hands) for a *Menstruum*, either by Chance or Consideration, in all the *Eastern* Parts of the World, where it is so universally taken, or in the inquisitive *Western* Parts of the World, where it has been studied and considered by great Numbers with the utmost *Diligence*: But they passing over Water as despicable, because common, (for Familiarity breeds Contempt) tho' its being made the Drink of all living Creatures by the *Omniscient* should commend it above all things, did like those, that regardlessly pass over a Jewel, or Treasure, and having once left it behind them, proceed farther and farther from it, the greater progress they make, concluding that it was not to be found the way they pass'd; not because it was not there, but because they could not see it.

As for the keeping of the *liquid Panacea* uncorrupted, I do not find it apt to change; however, because made so easily by bare throwing it into Water, it need not be kept long, but may be made upon all occasions, or at least one under the other,

other, as the Apothecaries spend it, who (it is not improbable) may by their great *Ingenuity* and *Experience* in those Matters, find other convenient Means to preserve it for their purpose:

CHAP.

C H A P. XXVI.

Of other Preparations of Opium, that are absolutely or tolerably safe in a moderate Dose.

I. **A**LL Preparations are very safe in a moderate Dose, wherein the resinous Part of the Opium is wholly separated from it. Such are all Extracts made in aqueous Menstruums, or any other that imbibes none of the resinous Parts of Opium: As the Preparation that Wedelius has in his *Opialogia*, L. I. Sect. 2. Cap. 5. p. 65. which is extracted out of Phlegm of Vinegar that remains after the Preparation of Arcanum Tartari. So Laudanum liquidum Cydoniatum, and Langelott's Laudanum, if the resinous Part be duly separated, are very safe and commendable for the like Reason; as is also Le Mort's Extract out of Rain-water, Diacodium, &c.

II. All Preparations wherein the resinous Parts of Opium, tho' not separated from it, are so alter'd, order'd, divided, &c. as not to stick to the Stomach, and render'd digestible and passable out of it without Offence, may be safely used. Of this kind there are, or may be two Sorts:

First, Such wherein the Nature of the Rosin is altered (in some degree at least.)

Secondly, Such wherein, tho' the Nature of the Rosin is not destroy'd, yet is it so ordered, divided, &c. as not to stick to the Stomach, but render'd digestible and passable without Offence.

Of

Of the First Sort are,

1. Such Preparations, wherein the resinous Part of Opium is quite altered in its Form and Nature by Chemistry, or artificial Tortures of Fire; which because hardly to be done without much impairing the *Sal-Volatile-Oleosum*, will be neither commendable, nor worth while, considering how easily, without that Trouble, Pains, and Labour, even the *Rosin* it self may be separated wholly from the Opium by aqueous Menstruums.

2. Such Preparations wherein the resinous Parts of Opium are altered, and (as it were) soapified by lixivial Salts or Soaps, which readily engage and intimately join with the small resinous Particles of the Opium, by long and strong pounding them together in a Mortar, or otherwise (as in *Matthew's* (or *Starkey's*) Pill, *Bates's* Pacifick Pill, &c.) by which means those resinous Particles become (in a great degree at least, if not wholly) miscible with, and so dissolvable, and digestible in the Liquors we drink, and easily subduable by the Menstruum at Stomach, out of which it also easily passes, by reason of the great slipperiness it acquires (which also prevents its sticking) by that intimate mixture with the Soap (or Lixivials:). Therefore I take those Pills of *Matthew's*, and *Dr. Bates's*, to be safe Preparations, tho' not to be compar'd to the *Panacea*, wherein all Danger and its Cause is quite taken away by wholly separating the resinous Parts, Earth and Filth, of the Opium from its *Sal-Volatile-Oleosum*: And (doubtless) had *Matthews*, *Starkey*, and *Bates* known, that the *Rosin* of Opium had been the Cause of its ill Effects, they would never have spent Months in preparing the *Sapo tartareus* to correct Opium, when they might, with the hundredth part of the Trouble, and fortieth

tieth part of the *Time*, wholly have taken away the pernicious Part by aqueous *Menstruums*, which they only pretend to correct by the *Sapo tartareus*; tho' I allow it (for the *Reasons* aforesaid) to be a good Corrector, yet cannot it equal the total separation of the pernicious Parts.

I am of Opinion, (upon my best *Thoughts* and some *Experience*) That intimately mixing and subduing Opium with good white Soap, may (for the *Reasons* aforesaid) prove a good and ready Corrector, or Preventer, of the Adhesion of the resinous Parts of Opium to the Stomach, much conduce to its Dissolution, or Digestion therein, and nimble slipping out of it, and thereby prevent all the ill Effects of Opium, which it causes by the Adhesion and Indigestibleness of its Rosin.

Of the Second Sort of Preparations of Opium, wherein its Rosin remains wholly unaltered in its Nature, yet becomes safe by dividing it, &c.

This is mainly, (if not altogether) done by a fine and through Division of the resinous Parts of Opium, and keeping them afterwards from a Coalescence in, and Adhesion to the Stomach, by which means they become digestible, or at least passable without Offence. This may be done,

I. By Torrefaction, till the Opium is very friable, and then finely powdering it, and mixing it with such things as are of good Consistence, &c. to keep the Parts of Opium from a Coalescence, as in Venice Treacle, Mithridate, Diascordium, the Philoniums, &c. This was the Way and Method that the Ancients used; which caused Galen to say, "That Opium alone (that is, undivided and unmix'd with other things to prevent its Coalescence, &c.) was dangerous; but mixt with other things was salutiferous," (which

(which they found by *Experience*, not knowing the Cause, but attributing the Safety thereof to something among the many *Ingredients* as a *Corrector* of the *Opium*.) Hence it was that they put small Quantities thereof into *Electuaries* made of many and much other *things*, that kept the *Particles* asunder; which they did so commonly, that (at last) all *Electuaries* were call'd *Opiates*. Thus we had those *Compositions* above named, which are safely used for the *Reasons* aforesaid; not that any thing therein corrects I know not what *poisonous* or *narcotick Quality* in *Opium*, but that the other *Ingredients* divide its *Rosin*, and afterward keep its *Particles* from *Coalescence* and *Adhesion*.

2. *Dissolution of Opium in Spirit of Wine*, or such *sulphureous Spirits* which finely divide the *Rosin*, and using the bare *Tincture* before the resinous *Particles* are again compacted (as in *Extracts*, &c.) may be of use, if duly administred.

But here a *Caution* is to be used, That you take it not in, or drink any *aqueous* or *pneumatick Liquid* with it, or before, or after it, in two or three hours; which if you do, the *resinous Particles* will be precipitated thereby, and so stick to the *bottom* of the *Stomach*, causing thereby the usual ill *Effects* of *Vomiting*, *Anxieties*, &c. Therefore it should be given only in a *spirituous Liquid*.

Note also, That if you give a *Solution* thereof in any *Lixivium*, you take Care not to dilate it by any *Means* by *aqueous Liquids* in Two Hours before or after you take it; for then there being but little *Lixivial Salt* in proportion to the *Liquid*, the *resinous Parts* are let go, and precipitated to the *Bottom* of the *Stomach*; as in the Case of the *Spirit of Wine* so dilated: Of which I have seen a very convincing *Instance*; for one that had an Esteem of *Lixivials* in this Case, not only (according to *Helmont*, and the *Common Cry*) to correct

rect Opium, but also to extract its *Vertue* the more effectually, made a *Tincture* of Opium in *Water*, lixiviated with *Salt* of *Wormwood*, whereof he took the Quantity that he had seen me give of my *Liquid Panacea*, in a *Coffee-Dish* full of *Water*, which precipitating the *Rosin* in the *Stomach*, caused him to *Vomit* in about an *Hour* after, and continued so to do for about 15 *Hours*. By which you plainly see, that the great Secret of *Lixivials* to correct Opium, lies meerly in its *Division* of the *Rosin* thereof, (as in the Case of *Spirit of Wine* and powdering it) and afterward keeping its *Particles* asunder during its Stay at *Stomach*; which the *Sapo tartareus* does (and probably other *Soap* may do) very well, for the several *Reasons* afore-said.

3. *Dissolution* of Opium in the *Yolk* of a rear new laid Egg, by pounding the Dose that you intend to take, with a little Quantity of the *Yolk*, till both be thoroughly mixed, and then taking it in the remaining Part of the *Yolk*: By which Means you not only finely divide the *resinous Parts* of the Opium, while the *Yolk* of the Egg intimately mixes with them, (as it does with other *Rosins* and *Turpentine*s) but send along with it into the *Stomach* what is digestible in it self, and more and more divides and separates the *resinous Parts*, and highly contributes to their final *Dissolution* and *Digestion*; so that (I doubt not) but you'll find this new, ready, and agreeable Means, as good (if not better, all Things considered) than the former, and even equal to the *Sapo tartareus*.

By what is said, tho' short, you may (because it is the clear Truth of Things) Judge of the Goodness of all Preparations of Opium. And,

1. That

1. *That resinous Things should not be added to Opium*; because such (like its own *Rosin*) renders it more indigestible, and apt to stick at *Stomach*: Hence it is, that the *Syrax Pill*, having resinous Things in it, and crude *Opium*, does so often cause dismal *Effects*, tho, (forsooth) much esteem'd for the *Lungs*, *Coughs*, *Defluxions*, &c. for having such *Balsamick resinous Things*, as *Syrax*, and *Olibanum* in it, whereas the Benefit is from the *Opium*. Had Dr. *Bates* known the Cause of the *Mischiefs* of *Opium*, he would never have put *Benjamin* in his *Pacifick Pill*.

2. *That all Preparations made of Extracts in Spirit of Wine*, are to be rejected, such *Extracts* being much worse than *Crude Opium*, and Experimentally found to be so; therefore our common *London Laudanum*, being made of *Opium* prepared in *Spirit of Wine*, is no commendable Preparation, tho' so much used, and cried up; which also *Experience* proves, in that it sometimes causes the ill *Effects* of *Opium*, when given alone in a good Dose. You'll find more of these Matters when you come to *Chap. 29.* which consists of *general Rules* and *Cautions* concerning the Use of *Opium*, therefore (tho' I may add some *Useful Observations*) I put an end to this Matter at present for that Reason; and because what is to be truly done in the Preparation of *Opium* is very evident from what is said, since the Cause of the ill *Effects* of *Opium* is now certainly known to be its *Rosin*; to the Separation or due Alteration of which, so as to cause it to pass the *Stomach* without Adhesion or Offence by its Stay or Indigestibleness, all regard must be had in the Preparation thereof, as is in the following Preparations, which are therefore safe.

C H A P. XXVII.

Shews the best Preparations of Opium, where to find them, and what is their respective Dose, &c.

YOU may infer out of the Premises, which are the best Preparations of Opium, viz.

I. Such as have the resinous parts of Opium separated from them; as,

1. *The liquid Panacea of Opium.* } Described in C. 25.
2. *The solid Panacea of Opium* } of this Book.
3. *Diacodium* (or *syr. e mecon.*) — In the London Dispensatory.
4. *Laudanum liquidum Cydoniatum.* — In experienced Mr. Wilson's Chymistry, and in curious Mr. Staphurst's *Officina chymica Londinensis*.

Note, That there are several needless Proceedings in this Preparation, as that of putting Yeast to it &c. Let your Aim in making it be to separate the resinous Parts; therefore instead of two Expressions directed, use only a careful Decantation, because the Resin may pass by Expressing it.

5. *Wedelius's Laudanum*, which is his *Opilogia*, L. I. Sect. 2. Cap. 2. P. 65.

Note, That the spumous part on the Surface is to be taken off, and the clear Tincture to be decanted from the Fæces, and afterward evaporated in Balneo, to the Consistence of an Extract.

6. *Le Mort's Extract* out of Rain-water, which you have in the most Learned Dr. Lowe's *Collectanea Chymica*. P. 304.

U

II. Such

II. Such Preparations, wherein the resinous Parts of Opium are altered, and as it were soapified by trivial Salts, or Soaps; viz.

1. Dr. Starkey's, or Matthews Pill, which you have in Mr. Wilson's Chymistry, p. 271, 272. In ingenious Mr. Skipton's Pharmacopœia Batæana, among the Pills; and in Mr. Staphurst's Officina Chymica Londinensis, among the Laudanums p 51.

Note, That the main Things to be regarded in the making up of this Pill, are 1. To spare no Labour in pounding, subduing, and intimately mixing the Sapo tartareus and the Opium. 2. That the Sapo should be twice as much as the Opium; that it may the better subdue the resinous part of the Opium.

Note, That as to the other Things contain'd in the said Pill, they may, or other things be added, or omitted, according to the Intention of the Physician; only this I say, that it is very convenient other things should be added to the Sapo and Opium, the better to separate and disgregate the parts of the Opium, (as has been intimated.)

Note, That if the Mass be too dry, you may (as Mr. Wilson directs) use some of the Oil that separates from the Soap, or rectified Oil of Turpentine, q. s. to moisten it.

2. Dr. Bates pacifick Pill; which you have among the Pills, in Mr. Skipton's Pharmacopœia Batæana.

Note, That the same Things are to be observ'd, as to this and Starkey's Pill, in all Particulars.

Note, That the Benjamin should be omitted, as being resinous.

III. Such

III. Such Preparations of Opium, wherein its resinous Parts remain unalter'd in themselves, yet so divided, separated, &c. as to be render'd innocent. such are,

- | | |
|------------------------|---|
| 1. Venice Treacle. | } All which you have in
the London Dispensatory. |
| 2. Philoneum Persicum. | |
| 3. Philoneum Romanum. | |
| 4. Diascordium. | |
| 5. Mithridate. | |

Note, That in all these Preparations, the Opium should be carefully mixed with the other Ingredients; and to that end, either torrified and finely powder'd, or dissolved in Water, which divides all its Parts, and then thoroughly mixed with the other Ingredients while 'tis off, or after 'tis reduced by Evaporation to the Consistence of a Syrup, or somewhat thinner.

6. Sydenham's Laudanum, which you'll find in Mr. Wilson's Chymistry.

Note, That the main Care in this Preparation, is to let the Liquor have a sufficient time to clear from the Fæces, and to separate from it; that you may by that means have less of the Resin.

Note, That this is best given in a spirituous Liquid, lest its Resin (tho' it cannot have much in it, if well decanted) be precipitated at Stomach.

Note, That the Henbane-seed in the Philoniums should be left out, 1. Because it makes the Dose more uncertain. 2. Because it is not to be esteem'd so much as Opium; at least you multiply things without necessity in putting it in.

Note, That *Pil. e Cynoglosso* (as was said in the last Chapter of *Pil. e Styrace*) is a very ill Composition, both upon the Account of the *resinous Things* that it contains , as also the *resinous Preparation* of *Opium* that it is made of; and therefore does (as that *e Styrace*) often cause grievous *Effects*: Nor do I think the *London Laudanum* (whose Name does probably recommend it more than any Thing else) worthy a Place among the *best* and *safest Preparations*, because the *Opium* is render'd worse, or more resinous, than the crude, by being extracted out of *Spirit of Wine*; and because it has too few other Ingredients to divide, segregate, and keep its *resinous Parts* from *Coalescence*; so that it may, and sometimes does cause ill Symptoms; so *Philonium magistrale* is to be rejected for the like *Reasons*, besides that it is otherwise a foolish *Preparation*, because *Opium*, *Benjamin*, *Myrrh*, and *Mummy*, are ordered to be made an *Opiate*, or *Electuary* with *Spirit of Wine*, which is ridiculous. So *Troch de Carabe*, and *de Terra Lemnia*, are not without their Faults, because one has *Frankincense*, and the other *Olibanum* in it, (which are resinous) tho but in a small Quantity. *Seif de Thure*, having a great Quantity of the *Frankincense*, is not commendable, since the *Opium* is also crude.

Now having shewn you, which are the best and worst *Preparations*, and why; it remains, that I shew you the *just Doses* of the *best* and *safest*; whose Number is very sufficient to answer all Intents, without meddling with such as may not be so safe, or neat.

An Explanation of the Table of Doses.

I Had once added an *Explicatory Table* of the *Marks* I use; but afterward considered, that all *Physicians* and good *Practitioners* in *Physick* do know them, and that it was not fit to intrust others therewith. Therefore I shall only add something for the better and readier *Use*, of the premised *Table of Doses*.

1. *Note*, That the sort of *Persons*, that you have to deal with, are placed in the *uppermost Space* of the said *Table*, and the *Doses* fit for such and such *Persons*, put directly under them in the same *Column*.

2. *Note*, That there are three sorts of *Doses* of every particular *Preparation*; that is the *least*, *middle*, and *biggest Dose*, under every sort of *Men* or *Women*, which are also of three sorts, the *strong*, *midling*, and *weak*, as you see in the *upper Space*.

3. *Note*, (therefore) That when you are about to give an *Opiate* to any *Man* or *Woman*, that you first look in that *upper Space* for the sort of *Person* you are to give it to, as *weak*, *strong*, or *midling Men* or *Women*: Then carry your *Eye* down in that *Column*, till you come over against the *Preparation* that you intend to give; and there you'll find in the said *Column* three sorts of *Doses*; the *lowest* on the *left Hand*; the *biggest* on the *right Hand*; and the *moderate Dose* between them.

As suppose you are about to give a *middle Dose* of the *Liquid Panacea* to a *strong Man*; see for (*strong Men*) in the *upper Space*, and for *liquid Panacea* in the *first Column* on the *left Hand*; under the *Word* (*Opiates*) and where the *Column* that belongs to *strong Men*, and the *Space* that belongs

to *Liquid Panacea* do meet, there you'll find, *gr.* 20—30—40 for the *least, middle, and highest Dose*; give which you think fit, according to your *Intention*.

So if you are about to give the highest Dose of the (*solid Panacea*) to a *strong Woman*, you'll find under the Words (*strong Women*) over against (*solid Panacea*) *gr.* 1—*gr.* $1\frac{1}{4}$ —*gr.* 18) which shews you, that *gr.* 18 is the *highest Dose* for a *strong Woman*, and so of all the rest.

4. *Note*, That I have been so cautious in dosing all the *Opiates*, that you may very safely give the highest Doses to all, but very weak Persons; to whom it is hardly fit to give any Thing, by reason of extream *Weakness*.

5. *Note*, That if you give any to *young Persons*, under the *Age* of 20. you should proportion the *Doses* not so much (as *idle Custom* directs) according to their *Years*, as *Bulk* and *Strength*.

For *Instance*, allowing *strong Men* to be 200 *pound Weight*, you must give a *strong Youth* of 100 *Pound Weight*, *Half* the *Dose* of the *strong Man*, and so of all other, only allowing somewhat less the younger they are, because of the *Softness, Fineness* or *Laxity* of their *Texture*; especially if they be very young, to whom *Opiates* must be cautiously given; or only *Diacodium* (which is best in that Case) and that in a small Proportion also; for young Children cannot bear *Opiates*, as well as grown Persons, no not in Proportion to their *Bulk* or *Weight*.

A Table of the *DOSES* of the Best and Safest *OPIATES*.

<i>OPIATES.</i>	Dose.	Dose.	Dose.	Dose.
Liquid.	To strong Men,	To midling Men, & strong Women,	To weak Men, & midling Women.	To weak Women.
<i>The liquid Panacea</i>	gt. 20 — 30 — 40	16 — 23 — 30	12 — 18 — 24	10 — 15 — 20
<i>Laudanum liquidum Cydoniatum</i>	gt. 20 — 30 — 40	16 — 23 — 30	12 — 18 — 24	10 — 15 — 20
<i>Sydenham's Laudanum</i>	gt. 20 — 30 — 40	16 — 23 — 30	12 — 18 — 24	10 — 15 — 20
<i>Diacodium (or Syr. e mecon.)</i>	ʒi — ʒx — ʒβ	ʒβ — ʒvi — ʒi	ʒβ — ʒv — ʒvi	ʒiii — ʒβ — ʒv
Solid.				
<i>The solid Panacea</i>	gr. i — iβ — ii	gr. i — i $\frac{1}{4}$ — iβ	gr. β — i — i $\frac{1}{4}$	gr. β — $\frac{3}{4}$ — i
<i>Wedelius's Laudanum</i>	gr. i — iβ — ii	gr. i — i $\frac{1}{4}$ — iβ	gr. β — i — i $\frac{1}{4}$	gr. β — $\frac{3}{4}$ — i
<i>Le Mort's Extract</i>	gr. i — iβ — ii	gr. i — i $\frac{1}{4}$ — iβ	gr. β — i — i $\frac{1}{4}$	gr. β — $\frac{3}{4}$ — i
<i>Dr. Bate's pacifick Pill</i>	gr. ii — iiβ — iii	gr. i — iβ — ii	gr. i — i $\frac{1}{4}$ — iβ	gr. β — $\frac{3}{4}$ — i
<i>Starkey, or Mat- thew's Pill</i>	gr. vi — ix — xii	gr. v — vii — ix	gr. iv — vi — viii	gr. iii — iv — v
<i>Philonium Romanum</i>	ʒβ — ʒii — ʒi	ʒi — ʒβ — ʒii	gr. xviii — xxiv — ʒβ	gr. xvi — xx — xxiv
<i>Philonium Persicum</i>	ʒβ — ʒii — ʒi	ʒi — ʒβ — ʒii	gr. xviii — xxiv — ʒβ	gr. xvi — xx — xxiv
<i>Venice Treacle</i>	ʒi — ʒii — ʒiii	ʒi — ʒiβ — ʒii	ʒii — ʒi — ʒiii	ʒβ — ʒii — ʒi
<i>Mitbridate</i>	ʒβ — ʒvi — ʒi	ʒiii — ʒv — ʒvii	ʒii — ʒβ — ʒvi	ʒii — ʒiii — ʒβ
<i>Dia/cordium</i>	ʒβ — ʒvi — ʒi	ʒiii — ʒv — ʒvii	ʒii — ʒβ — ʒvi	ʒii — ʒii — ʒβ

The Doses of *London Laudanum* (which I mention rather for its general Use than *Laudableness*) may be the same with that of the *Pacifick Pill*.

A Table of Marks very necessary, for the better understanding of the Table of Doses.

gt. —)	a Drop.	$\frac{1}{4}$ —)	a Quarter	} Of any Thing.
gr. —)	a Grain.	$\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, or β)	Half	
ʒ —) signifies	a Scruple, which is 20 Grains.		3 Quarters	
ʒ, or ʒ)	a Dram, which is 3 Scruples.			
	(an Ounce, which is 8 Drams (or Drachms))			

[illegible]

C H A P. XXVIII.

The Cure of the ill Effects of Opium.

HAVING shewn how to prepare Opium, so as to render it safe and innocent in a *Moderate Dose*, and how much that *Moderate Dose* is, one may be apt to think that this *Chapter* is needless; but when you consider how many there are that may be negligent, wilful, want Time, Skill, &c. to prepare it, or take too much, or too long of it, and that the *Physician* must be able to Answer and Remedy all ill Accidents that may happen, you'll find it very requisite that I should shew how to cure the ill Effects of Opium, which proceed either,

1. From its *Resin at Stomach*; Or,
2. From too much Relaxation by an Excessive Dose; Or,
3. From a long and lavish Use of it; Or,
4. From a sudden leaving it off, after a long and lavish Use thereof.

I. To Cure the ill Effects of the *Resin at Stomach*, you are,

First, To know whether that be the Cause; which you may learn,

1. By considering whether *Crude Opium*, or some resinous Preparation thereof, was taken, especially by it self, in the Form of a Pill or Pills, as an Extract thereof out of Spirit of Wine, or Pil. e Styrace, or London Laudanum, or the like, not duly prepared, as has been directed.

U 4

2. By

2. By the *Symptoms*, which are these, *viz.* a *Nausea*, *Puking*, *Vomiting*, *Hiccough*, *Convulsions*, *Distresses*, and *Anxieties* about the *Stomach*, particularly the Part call'd the *Pit* of the *Stomach*, *Swimmings* in the *Head*, *Vertigo's*, *Palpitations* and *Tremblings* of the *Heart*, *Agitations*, *Uneasiness*, a *Turbulent Pulse*, and (after a *Struggle* of *Nature* under those *Symptoms*) *Faintings*, *Leipothymies*, *Syncopes*, &c. which last you must not take for certain *Signs* and *Symptoms*, unless the former have preceded them, because it is not impossible but they may happen from the *Quantity* of the *Opium*, *Condition*, or *Constitution* of the *Person*, &c. but this (when all *Things* are compared together) will be easily *Judged* of, especially if you observe;

1. Whether those *Faintings* or *Leipothymies* be not more like the *Failures* and *Stupors* of *Drun-kards*, than bare *Faintings*; if they be of the first sort, then do they proceed from an over-*Relaxation* occasioned by the *Opium*, and not from its *Rosin*, the *Cure* of which belongs to the *second* particular.

2. Whether they are more attended with the *Signs* of *Relaxation*, as *Deadness* of the *Eyes*, *Falt-ring* of the *Tongue*, *Darkness* before the *Eyes*, *Di-latation* of the *Pupilla*, *Efflorescence* of the *Skin*, *Laxity* of the *Limbs*, *Want* of *Feeling*, *Stupidity*, *Sleepiness*, *Failure* of the *Senses*, or of *making Wa-ter*, *loss* of *Memory* or *Understanding*, a *dry Mouth*, a *slow* and *wide Pulse*, and other *Things* much like the *State* of a *deadish Drunkenness*; for then those *Failures* are the *Effect* of *Relaxation* by the *pleasant Sensation* that the *Opium* causes.

But after all, it is the sort of *Opium* that was taken, and the first *Symptoms* of a *Nausea*, *Vomit-ing*,

ing, &c. are most to be depended upon, for it may happen sometimes (as after a great Dose) that the *Rosin* may stick, &c. and the *Relaxation* be excessive also.

Secondly, When you are satisfied, that it is the *Rosin* at *Stomach* that causes the Mischief, and not bare *Relaxation*, you are not to promote or stop the *Vomitings*, lest in the first Case you torment and endanger the Person to no Purpose, for the *Rosin* does generally (if not always) stick too fast, and too little in Bulk to be shaken off by *Vomiting*, or the *Contraction* of the *Stomach*, as appears by the tedious *Vomitings* that happen thereupon, and the Nature of the Thing; so that (I believe) it is seldom or never carried off that way, and that when People are at last relieved, it is by a gradual *Waste*, *Dissolution*, or *Digestion* of the *Rosin*, as in great measure appears also by its *Purging* some Persons after *Vomiting*, and a long time after it is taken in a considerable Quantity. Nor are you to stop the *Vomiting*, as not knowing what Nature may Advantage her self thereby, but indeed it is more than you can do, generally speaking, (if not always) while the *Rosin* teazes, urges, and stings the *Stomach*.

It evidently follows, that the Cure must consist in the *Dissolution* of the *Rosin*.

For this Purpose you have Four Effectual Dissolvers of the *Rosin*, (as you may observe from the Chapter of the Preparations of Opium) that may be used with safety in a Moderate Dose; 1. *Lixivial Salts*, whereof the best is Salt of Tartar. 2. *Sulphureous Spirits*, whereof the best is high rectified Spirit of Wine. 3. The Yolks of Eggs, whereof the best is the Yolk of a rear new laid Egg. 4. White

4. *White Soap*, or rather the *Sapo Tartareus*. With these judiciously used, you may (by Gods Blessing) Relieve and Cure the Person grieved with the *R sin* (or noxious Part) of *Opium*.

1. Give with all possible speed One scruple of *Salt of Tartar*, in a Spoonful or two of *Brandy*, or some other *hot Cordial Spirit*, (if *Spirit of Wine* be too hot) placing the Person in the very same Posture that he was in when he took the *Opiate*, that it may fall directly upon its *Rosin*, which most probably sticks where the *Opiate* first fell upon the *Coat* of the *Stomach*; then stay for a Minute or two, and give a Spoonful or two of the *Brandy* or *Cordial*, with (if need be) the *Salt of Tartar* in it.

If you find Cause, either because the first *Doses* were Vomited, or that the Quantity of the *Rosin* was great, or that the *Person* grows worse, you may often repeat it, for we must not be sparing in safe Things in dangerous Cases, I think it may well be repeated after every Vomiting *toties quoties*.

I have a great Opinion of the *Yolk of an Egg* in these Cases, not only because it does (as the other Things) mix with the *Rosin*, but because being of a good Consistence, it sticks to it, and fastens upon't the better, and is not so clearly shaken from it by every *Vomit*, as Liquids are; therefore I think it very Useful to be given now and then immediately after *Vomiting*; however, let no other Food be given but it, and be sure to use it when you have not the aforesaid Things, I believe it will be found by *Experience* (which is yet much wanted, because it has not been used) to be the very best Help in these Cases, for the
afore-

aforesaid Reasons, and because its fine Oiliness will correct the Volatile Salt of Opium. I cannot imagine but White Soap, or rather the Sapo tartareus, (if you have it by you) may be of very good use to dissolve and carry off the Rosin.

2. When the Vomiting begins to cease, you must distinguish well whether it be because the Person is better, and the Stomach discharged of the Rosin, or because tired Nature yields it self to Rest, by a sort of Succumbency to the Fatigue or Leipsobymy.

You may easily distinguish these Cases; for in the first Case every Thing seems better, and in the last worse, saving that the Vomiting ceases, which was an endeavour of more vigorous Nature, and therefore its failing is now an ill Sign.

In this Case good Old Wine, and Spirituous Cordials, which may rowse and invigorate Nature, and also engage with the Rosin by their Sulphureous Spirit, must be of excellent Use.

Note, That if you want Salt of Tartar, other Lixivial Salts may serve, as those of Wormwood, Broom, &c. only you must give at least One Third more; and in Case of great Haste and Urgency, you may give the very Ashes of Wormwood, Broom, or any Vegetable, in 2 or 3 times the Quantity as the Salts are to be given, in 2 or 3 Spoonfulls of Brandy, or a Glass of Old Wine, or both mixed together, for the very roughness of the Ashes will, in some measure, contribute to wear off the Rosin, and thereby assist the Lixivial Salt that is in them.

3. If

3. If the Quantity of the *Resinous Opium* was great, it will be convenient, when you perceive the *Vomiting* begin to abate, to give as much of *Daffee's Elixir*, or *Tinctura Sacra* made in some Spirituous Liquor, as does usually give Six Stools; it is best *Purging* with a Liquid, because speedier in Operation, and that it should be *Spirituos*, to help the *Dissolution* of the *Resin*.

I. Note, That you also take Care not to be too busie with *Spirituos Liquors* when they are much relaxed, and have such Symptoms as Drunken People have, especially if they appear in a high degree, for too much of them may promote the *Relaxation*.

2. Note, That in *Faintings* or *Leipothymies* after such *Vomitings* and *Struggle* of Nature, you must not so much excite them by *grievous Sensation*, as *pinching, pricking, &c.* (for those *Leipothymies* are (as was said) a sort of *Recruit* as *Sleep* is, and therefore the last *Refuge* of Nature for that End) but with *Spirituos* and *Comfortable Things*, as knowing that there is an awaking by *Recruit*, (which is Natural) as well as by *grievous Sensation*, which is forced and unnatural (as has been shewn.)

II. To Cure the Effects of too much Relaxation by an excessive Dose, &c.

First, You must be satisfied, that the ill Effects thereof are from too much Relaxation.

1. By considering the Preparation of *Opium* that was taken, for if you find that it was such as had the *Resin* duly separated from it, you may be sure

sure, that the *ill Effects* are only from *Relaxation*, because the *Dose* was too great; or if it was a Preparation that had the *Rosin* so subdued or altered, as you find directed to render it safe, you may presume the *ill Effects* are from over-*Relaxation*; for such Preparations are otherwise safe and innocent, except when the largeness of the *Dose* (as that of good *Wine*) causes too much *Relaxation*.

2. By the *Symptoms*, which are these, viz. *Alienation of the Mind*, *Loss of Memory*, *Stupidity*, *Sleepiness*, *Sopors*, *Failures of the Senses*, as *Darkness of the Eyes*, *seeing Things double*, *various Colours before the Eyes*, *Loss of Feeling*, *Ease from Pain*, &c. *Deadness of the Eyes to the View*, *Dilatation of the Pupilla*, *Efflorescence of the Skin*, *Laxity of the Lower Jaw*, *Intumescence*, and *Laxity of the Lips*, *Faltring of the Tongue*, *Sardonick Laughter*, *Laxity and Weakness of all Parts*, a general *Ineptitude to Motion*, *Failure in making Water*, *going to Stool*, and in all Things that require *Strength*, *Contraction*, *Motion*, &c. *Difficulty of Breathing*, a *wide and slow Pulse*, a *Condition in general very like that of Drunkenness*, which also proceeds from *Relaxation*.

Secondly, When you are satisfied that *Relaxation* is the Cause, use all Means to procure a due *Contraction* of all Parts; which is to be done,

1. By removing the Cause of the *Relaxation*:

2. By using all good Means for *Contraction*.

First, therefore, give a brisk, quick, and strong *Vomit*, both to discharge the *Opiate*, and cause *Contraction* of Parts by a grievous Sensation.

Proportion it to the *Deadness*, *Stupidity*, or *Sleepiness* of the Person, so as to give it of twice the ordinary Strength of *Vomits* in Case there is great *Danger* from those *Symptoms*, and that they are of a high Nature.

After the Person has Vomited 3 or 4 Times, or so often as that you may judge the *Stomach* well cleared of the *Opiate*, give Half an Ounce of *Cream of Tartar* finely powdered in thin *Broth*, *Whey*, *Water*, *Small Beer*, or any convenient Liquid, which will correct the *Opiate* if any remains at *Stomach*, turn the *Vomit* to a *Purger* to clear the *Intestines* also, and contribute much to the *Contraction of Parts*, which you must always have in your *Thoughts*, as the ruling *Intention* in this Case. Therefore,

Secondly, You must use *Contractors* all the Time, the chief of which are *Cold*, grievous *Sensation*, (or *Pain*) *Terrour*, *Fear*, *Voluntary Motion*, and *Acids*, which last cannot be so well used during the *Vomiting*, lest they stop it.

Therefore (especially if the Person be very *Stupid*) keep him very *Cold*, for he will hardly feel it, nor take *Cold*, because the *Relaxation*, and the *Insensibleness* of *Grievance* by *Cold*, &c. keeps the *Pores* open ; let him be (if possible) in some *Motion*, as *Walking*, *Hewing*, *Sawing*, *Knocking*, *Tugging*, &c. the more violent it is the better, because it causes more *Contraction* and *Agitation* to prevent *Sopors* ; To force him to *Motion*, (if need be) *Pricking*, *Pinching*, or *Whipping* him about the *Legs*, &c. will be of good Use, because grievous *Sensation* adds *defensive Contraction* (which is the greatest sort) to that of the *intensive Contraction* by *voluntary Motion*.

These

These Means failing, he should be exposed stark naked to the coldest *Air*, and in desperate Cases thrown suddenly at unawares into cold *Water*; by which Means you cause *Terrour*, *Surprise*, and *Cold*, (which are the highest and most forcible *Contracters*) to conspire to the *Contraction* of Parts; Hence it is that Drunken People, who are so from *Relaxation*, become Sober, as in a moment, by that Means.

All the time, but during the *Vomiting*, let him use cold *Acids* in great Plenty, and very manifestly acid, for they will not only contribute to *Contraction*, but very much correct the *Opiate*; To this End *Juice* of *Oranges* or *Lemmons*, *Verjuice*, or *Water* acidulated to a good degree by *Verjuice*, *Vinegar*, *Juice* of *Lemmons*, *Spirit* of *Vitriol*, *Sulphur*, or the like, will be very proper.

Where you have not the Convenience to plunge them into cold *Water*, (as is directed) dashing or pumping very cold *Water*, or *Water* with a Fourth Part of *Vinegar* upon their naked *Bodies*, will be of great Use, especially if surprisingly done, to cause the more *Terrour* and *Concern*.

These Things may be done more or less, as Cause may require, which must be left to the *Discretion* of the present *Physician*, or *Friends* and *Standers* by (in Case there be no *Physician*;) I only Caution, that *Contracters* should not be used too sparingly, and that you should never cease to advance in the Use of them till you perceive their good *Effect*, and then to continue them as occasion requires.

Note,

Note, That the Case may well happen, that the *Rosin* may stick at *Stomach*, and yet no Signs or Symptoms appear but those of *Relaxation*, by *Reason* that the Feeling at *Stomach* may thereby be disabled to take any notice of it.

To be sure of this, you have no other *Means*, because the *Symptoms* and Effects of *grievous Sensation* cannot appear, where it is not (for the *aforesaid Reason*) but to examine whether the *Opiate* was a *resinous one*, as *crude Opium*, *Extract* out of *Spirit of Wine*, or the like, for then you may conclude, especially if they were given in a *massy solid Form*, as that of *Pills*, &c. without severing the Particles of the *Rosin* by other Things, as the *Yolk* of an *Egg*, &c. that the *Rosin* may in all Probability stick at *Stomach*, tho' its Symptoms do not appear for the *aforesaid Reason*.

In such a Case the best Advice that I can give is, externally to use all Contracting Means, as is directed, and internally the Means prescribed for *Dissolution* of the *Rosin*, for you'll thereby answer both *Intentions*.

Failure of making *Water* often happens in these Cases, which you may generally help by only clapping the *Scrotum* to the cold Chamber Pot, or into cold *Water*, and if that will not do, put some *Vinegar* into the *Water*, and that failing, he must be stript, and cold *Water* pumpt or dashed upon the *Region* of the *Bladder*.

III. To Cure the ill Effects of a long and lavish Use of *Opium*. These Effects (as you may easily observe, if you take a *View* of them where they are enumerated in *Chap. 6.*) are either,

I. From

1. From an over-much and habitual Relaxation of Parts, as Weakness, a Moapish Disposition, Diminution of Appetite, Weakness of Digestion, Dropsies, Weakness of Memory, &c. - Or,
2. From Acrimony, as frequent Irritations to make Water, Priapisms, Erections of the Penis, fruitless Inclinations to Venery, &c.

In this Case (as in that of old Drunkards, which is much the same) there is no good to be done till the *habitual Cause* is removed, viz. the Taking of Opium, which suddenly to leave off is (as was shewn) very dangerous. Therefore, in order to leave it off safely ;

1. You must stop your Hands, and not increase the Dose that is taken, by which Means it will come gradually to have little or no Eff. &c.
2. When you find that it is come to that pass, your Work is half done ; then only lessen it 100th Part every Day till you come to take none at all.
3. If during this retrograde Course you find any Faintness, drink a Glass of good Stomach-Wine toties quoties, as Gentian, or Centary Wine, or the like, made by Infusion in Claret ; or, if you want such, a Glass of the Claret it self ; which Things will excite the Spirits, and help Digestion.
4. When you have quite ended the Taking of Opium, continue to Use such Wines when you are faint, and every Morning take in a Glass of Gentian Wine Two Drams of the Chalybeate Wine described in the London Dispensatory, increasing about a Scruple every Day till you come to Half an Ounce, which take for Two Months at least, afterward decreasing, as you encreased, till you come to One Drachm, and so give over.

But if you find *Occasion*, you may continue that Course longer, or as long as your *Physician* thinks fit.

After all, you may use a *Glass* of *Claret* when faint, but be sure to be moderate, and not run from one *Excess* to another.

As for the *Acrimony* of *Bloud*, that is more during the *Taking* of *Opium*, and will soon after gradually wear off, especially by the Course directed; if not, *Camphire* is the *adequate Remedy*, of which with equal Parts of *White Resin*, and *q. s.* of *Mucilage* of *Gum. Tragac.* you may make *Pills* of 5 *Grains* weight, taking 4 of them every Night at *Bed-time* in a *rear Yolk* of an *Egg*, as long as it is necessary; for *Camphire*, by its fine *Sulphur*, corrects the *volatile Acrimony* of *Cantharides*, *Opium*, &c. and so allays *Tuillation* to *Venery*, &c. as is observ'd.

IV. *The ill Effects of a sudden leaving off of Opium*, as *Anxieties*, *Distresses*, *Depressions of Spirits*, which (as was said) are very dangerous, are remedied no other way, but either,

1. *By returning to the Use of Opium*, which is a most certain *Cure*, and afterward (if you please) give over the *Use* of it after the manner that I directed, which you'll find to be safe; nor can I advise you to trust any other *Method* of leaving it off, unless it be,

2. *By substituting Wine instead of Opium*, which is not quite so safe or certain; your best *Method* of using it, is to drink a good *Glass* of it so often as to keep the *Comfort* thereof at *Stomach* continually, that so it may answer the more permanent *Effect* of *Opium*, and keep you from a faint *Condition*;

dition; but seeing also that this Course is not convenient to be continued long, you must gradually lessen the *Dose* of this, as you are directed to do that of *Opium*, till you come to take none, or (at least) a moderate and wholesom Quantity.

Note, That if such as used to take *Opium* are even almost expiring for want of it, you must, to prevent imminent *Death*, give a *Liquid Preparation* thereof to the value of what the Person was used to take, in a *Cordial Vehicle*, as *Spirit of Wine*, *Brandy*, or the like, because such hot *Spirituos Vehicles* do (as has been shewn) immediately give some Comfort by actuating and warming our *Spirits*, till the *Opium* comes to Operate, which will not be long, because it is in a *Liquid Form*; if you find the Person sink notwithstanding, he may be kept up by repeating the *Brandy* or *Cordial* without any *Opium* in it, till the *Opiate* operates, which will certainly (by *God's Help*) set him right, in case it does but begin to operate before he is dead. See *The Philos. Transact.* for *June, July, August, 1696.*

Note, That it is a very false *Imagination* that *Authors* have of the *Turks Capacity* (by *Nature*, *Climate*, or the like) to take more *Opium*, or in greater Quantity than we may, but that they make more *Use* of it, and by that means come to take 2 or 3 *Drams a day*; for they begin with such small Quantities as we commonly give, till by a long Custom of taking it they come to take the said Quantities, which is but small in Comparison of what several *English People* that have been used to it do, or have taken, as I could Name several to you, if I had not *Reasons* to the contrary; however, I am at Liberty to tell you the Quantities, tho' I must forbear naming the Per-

fons; some have daily taken 2, 3, 4, 5, 6 *Drams*, nay, I have heard of some that have taken an Ounce a Day, and of One that took *Two Ounces*, whereas the Learned and Curious Dr. *Edward Smith*, could find none about *Smyrna* who took above 3 *Drams* a Day.

All this is most agreeable to Reason, and the whole Current of my *Discourse*, viz. That it can be better born in cold than hot Weather, and consequently in cold than hot Climates; by firm Fleshed Persons, than such as have soft and flaccid *Flesh*, as the Southern People have in Comparison of the Northern, and such as inhabit cold Countreys. Therefore you may be sure that such as Enquire into the Cause, why the *Turks* and other Eastern People can take greater Quantities than we can, seek for the Reasons of Things before they know the Fact, nay, when the Fact is quite contrary to what they build upon; We may as well expect *Edifying Discourses* from them that Enquire why Fire is cold? Water dry? and the like, as from such as suppose Things contrary to true and sensible Experience.

C H A P. XXIX.

Some general Rules, Cautions, &c concerning the Use of Opium.

THo' there is hardly any *Rule, Caution, or Thing* worthy of *Observation*, concerning the *Use of Opium*, but what is implied, or easily inferable from what has been said; nor, (now that the true Nature of *Opium* is discovered) can there be such *Fears and Jealousies* (which multiply *Cautions*) concerning the *Administration* thereof; (for every one may now easily see wherein its *Danger and Benefit* lies) yet because a *Chapter of Rules and Cautions* may be expected, as being usual, and to have a *single View* of such as lie more scatter'd, and not so readily found in the *Body of the Book*, I will, to introduce the *Use of Opium* with more *Clearness* and perfect *Security*, give you a *Collection of general Rules and Cautions* concerning its *Use*; whereof some are mentioned, and most inferable from the *Premises*.

I. As to its *Substance*.

1. It should be always given, freed from its *Resinous Parts*, if you can get such a *Preparation*.
2. It is also neat and convenient, that it should be freed from all its *Earth and Drags*.
3. Never give *Opium*, but either so prepared, or with its *Resin* so subdued, segregated, or altered, as I have shown in the safe *Preparations* thereof. It follows that,
4. *Crude Opium*, and *Extracts* made in *sulphureous Spirits*, are utterly to be rejected.

X 3

5. Never

5. Never give it mix'd, or join'd with *resinous Things*. (as has been intimated.)

6. Never mix, or join it with other *Opiates*; 1. Because none of them are so good. 2. Because they are not so well known. 3. Because it makes the *Dose* more uncertain. 4. Because those other *Opiates* are used unprepared.

7. *Pil. e Styrace*, because made of *resinous Opium*, join'd with *resinous Things*, as *Styrax calam.* and *Olibanum*, is an insufferable Preparation, (tho' commended) and therefore has frequent ill Effects, to my Knowledge.

8. *Pil. e Cynoglossa* is such another, having two *Opiates* in it besides *Opium*, extracted out of Spirit of Wine, (which is far worse than crude *Opium*, tho' by the way of *Eminence* call'd *Opium prepared*, in our *Dispensatory*) *Styrax calam.* and *Olibanum*, which are *resinous*.

9. *Laudan. Lond.* is also an ill Preparation, as having the *Opium* extracted out of Spirit of Wine to make it worse than when Crude; therefore has sometimes ill Effects, especially when used alone in the Form of a Pill, in a large Dose, (as was said.)

10. *Philonium magistrale* is also to be rejected, because the *Opium* is prepared in Spirit of Wine, and *Benjamin* added, which is *resinous*.

11. *Philon. Rom. & Persic.* are tolerable, because the *Opium* is disgregated, and mix'd (as *Galen* would have it) among much, and several other Things, which keeps it's *resinous Parts* from Coalescence.

II. As to its Form.

1. A Pilular Form of crude *Opium*, or any *resinous Preparation* thereof, wherein the *Resin* is not duly subdued, segregated, altered or corrected, is (as has been shown) the most pernicious.

2. The

of Opium Revealed. 311

2. *The Form of an Electuary* is commendable; 'tis in small *Quantity*, mix'd therein with many or much other Things, that prevent the *Coalescence* of the *resinous Particles*.

3. A *liquid Form* is generally good, because the Parts, as in a *Tincture of Opium in Spirit of Wine*, are severed, and segregated; yet it is not so very safe, where the *Resin* is not separated; because if Care be not taken (as has been directed) the *resinous Particles* may be precipitated at *Stomach*, and so coalesce and stick to it.

4. The *Operation of Opium* is quicker in a *liquid Form*, but more lasting in a *solid Form*, especially if the *Opium* be *resinous*; which, tho' noxious in general, yet has the *Advantage of Duration*, where it may be born, as in Persons of a *robust Texture* and *good Digestion*, or where Custom has taken off it's Grievounesses, as you find in habitual *Tobacco-taking*, &c.

5. The *liquid Panacea of Opium*, is better for *Alteration*; because it is the first Fruits of the *Opium*, and more sincere and unaltered by *Fire* than the solid. But,

6. The *solid Panacea* is better, where a stay at *Stomach* and the *Intestines* is convenient, as in stopping of *Vomiting*, *Loosenesses*, &c. To be brief,

7. *Liquid Forms* should be always given in *soul Stomachs*, where the *Digestion* is weak, in *Fevers*, and when a nimble *Operation* is requisite.

III. As to its Dose.

1. *The mean or middle Dose* is generally to be used; and where there is no *Direction* to the contrary.

2. *The mean Dose* may serve, except in *violent Pain*; or where much of the *Opiate* is lost; (as it happens very often in *Vomiting* or *Loosenesses*) or to

excite *Venery*; because those Parts are remote, and require a very *sensible Titillation*. But as to these matters, you'll have *particular Directions* in the *respective Cases* in the following Chapters, that treat thereof in a *special manner*.

3. The *Dose* must be proportionably less in the *fine and lax-textured Children, Women, warm and moist Weather, weak Stomachs, Persons much debilitated, or over-tired with Work, Labour, Disease, &c.*

IV. As to its *Vehicle*.

1. It should generally, (unless there be particular Cause to the contrary) be pleasant and agreeable to the *Taste and Stomach*, that it may rather conspire with the *Opiate* to please the *Membranes, &c.* than contradict the *Sensitive Pleasure*, that it causes.

2. It should not be an *Acid*, because it infringes the *volatile Nature* of *Opium*, except some particular Case requires it; which will be seen hereafter.

3. It should not be a *Volatilo-saline*, especially to cause *Sleep*, or because that may render it too acrimonious or pungent, and so hinder *Sleep, Composure, &c.*

4. It should not be *lixivial*, because its fixed Nature opposes the *volatile*; except it be, where the *Opiate* is *resinous*, to help its *Dissolution*. Therefore,

5. *Wine, or fermented Liquors, Cordials, Waters, or smooth and pleasant Liquids, as Emulsions, Milk and Water, Water and Sugar, &c.* will be the most proper (generally speaking.)

6. The *resinous Opiate* should be always given in *sulphureous Spirits, Wine, or strong Liquors, or in a lixivial Vehicle, or rather in both mixed; or in a rear Yolk of an Egg, or finely powdered and well mixed with Electuaries, Bolus's, Conserves, thick Sy-*
rups,

raps, Pulps, or any Thing that is innocent, and of a good Consistence, to keep the resinous Particles asunder, and to prevent their Coalescence; for which End, I judge, that good white Soap must be (because of the Alkali, its Slippriness, and Aptitude to join with the Rosin) a good Vehicle, the Opium and scrapings of the Soap being mixed with a little Rose-Water, (and what else you think fit, to render them more acceptable) by pounding them in a Mortar for a good while, to an intimate mixture.

V. As to Time.

1. Give the *Liquid Forms* half an Hour at least, or an Hour, before the Time you would have them operate.

2. Give the *solid Forms* an Hour, or an Hour and a half, before you would have them operate.

It is very silly, not to give them till the very Time that they should operate, as 'tis usual at Bed-time, when they should be then operating, and causing *Sleepiness*, that the *Rest* and *Ease* of lying down may concur with it; whereas if People are unapt to sleep, (as generally they are who take *Opium*) they, not taking it till Bed-time, lie tossing and tumbling, grow uneasy, and restless, and the Bed hard, and (in a great part of the Year) too Hot, before the *Opium* operates, so that the *Opium* cannot take Effect, by Reason of *Disquietudes*, so the Persons lie all or most Part of the Night without any Sleep; whereas if it be so given as to cause a great *Sleepiness* by the Time they go to Bed, their lying still a very little Time (which they are then apt to) and the Bed being soft, easie, cool, and pleasant, they immediately sleep, and their Spirits being compos'd, continue their Sleep all, or most Part of the Night. Therefore I have often come where People had not slept, tho' they took an *Opiate* at Bed-time, and given them the very same a convenient Time before, and they have sweetly

ly slept, to their Heart's *Desire* and *Refreshment*.

4. Give *Opiates*, as to Meals, at least 3 *Hours* before and after them, or about the middle Time between them, if it be in the *Day-time*, or when the *Stomach* is near empty, or but little or light matter in it; which if gentle and agreeable, will help Men to *sleep*: But great *Repletion* and perfect *Emptiness* or *Hunger* (which is a grievous Sensation) do disturb or hinder *Sleep*.

5. *Opiates* may, and have proved inconvenient before or after *Letting of Blood*, and *Hemorrhages*, especially if the *Evacuation* was large, and sudden; the Reason is, because the Persons being very dispirited, and so much inclined to *Sleep* of themselves, may sleep too much and dangerously; and because *Opium* relaxing hinders the *Vessels* duly to contract upon the remaining *Blood*, which may cause a *Discontinuance* of its Streams, by Reason that the diminished *Blood* may not suffice to fill up the relaxed *Vessels*; tho' this may seldom happen, because the *Compressure* of the *Air* is appointed by most wise *Providence* to close all our *Vessels* in such Cases; but it must be better done, when the Parts themselves do also duly contract, which *Opium* hinders.

6. You have much the same Reason not to give them soon after other large *Evacuations*, where a due *Contraction* of the Parts is requisite; as after *Tapping*. (or *Paracentesis*) in *Dropsies*; *Child-birth*, &c.

7. *Opiates* are best given in the Morning, to cause *Euphory* or *brisk Effects*, because the *Refreshment* gain'd by the Night's *Sleep* does not only concur towards *Euphory* and *Briskness*, but also much oppose *Sleepiness* and *Drowsiness*, which are not consistent with *brisk Effects*.

VI. As to Persons.

1. It is not convenient to give *Opiates* to Persons *very young* or *very old*.

2. They agree better with *Men* than *Women* or *Children*; With *Men* of a robust and hard, rather than of a weak, fine, tender, and soft *Texture*; with such as have a *strong Digestion*, than a weak; and in general with the *strong*, rather than the *weak*. Therefore,

3. Never give them to *Persons* that are *very* weak, especially if they take, or digest no *sustenance*, or extremely little, for *Reasons* already given; nor to such as are near their *End*, or almost expiring; Except it be for want of *Opium*, or by *Extremity* of *Contraction* by *Terrour*, *Pain*, *Cold*, *Convulsions*, &c. for then it will do *Wonders* in preserving People, that are otherwise past all *Hopes*, by relaxing, taking away *Pain*, *Contractions*, &c.

4. It is not so agreeable to the *very fat* or *moist*, because they may be over-relaxed; nor to the *very lean*, and *dry*, &c. (especially to cause *sleep*) because it is apt to irritate and actuate their *Spirits* too much, by which means *Sleep* is much hinder'd.

VII. As to *Maladies*, and *Diseases*, &c.

I. *Opiates* are not convenient in *Relaxations*, as such; as *general Palsies*, *Hemiplegia's*, *Palsies* of the *Eyes*, *Deadness* of them, *Dilatation* of the *Pupil*, *Relaxation* of the *Tympan* of the *Ear*, of one *side* of the *Face*, which makes the other *side* contract, and and so draw the *Face* awry; for 'tis not a *Spasm* or *Convulsion* (as *Men* imagine) of the contracting *side*, but a *Resolution* of the other, which permits

mits the *Antagonist Muscles* of that side to contract without *Opposition*, and draw the Face toward the strong or sound Side : *Relaxation* of the *Uvula*, or the annex'd *Valvæ*, (which last is known by Snuffling without any other evident Cause, or by observing that it does not shut in sounding *u*, (in *but*, *cut*,) &c. by it self ; *Relaxation* of the *Larynx*, and *Windpipe*, (which is known by a hoarse kind of *Whisper* without a *Cold*, or any evident Cause ;) Of the *Pharynx*, or *Gullet*, (which is known by a *Depravation* of swallowing without *Pain*, or *Tumor*, or any evident Cause ;) A *Paralytical Asthma*, or difficulty of Breathing, wherein Men heave the *Shoulders* without any apparent Cause ; *Relaxation* of the *Stomach*, as when Meat stays too long at *Stomach*, &c. A *Palsie* of the *Intestines*, or *Guts*, as when one is bound, and cannot refer it to any other Cause ; Of the *Bladder* (when one cannot make *Water* without any other Cause to refer it to ;) *Relaxations* of the *Sphincters* of the *Bladder*, and *Anus*, (that is, when *Urine*, or *Ordure* fall from one involuntarily ;) nor are they convenient in *Baths*, unless great *Relaxation*, as for *Passage* of the *Stone*, &c. is intended.

Nor in *Ruptures* as *Bronchocele*, (of the *Windpipe* ;) *Exomphalos* (of the *Navel*) *Bubonocèle* (of the *Groin* ;) or the *Fall* of *Humours*, *Guts*, *Fat*, &c. into the *Scrotum*, or of the *Fundament*, *Womb*, or the *Vagina*, &c. except it be to reduce them.

Nor in *Lunations*, *Sprains*, *Laxity* and *Weakness* of *Joints*, *Limbs*, *Back*, &c. *Extensions* of *Nerves*, *Tendons*, *Ligaments*, &c. Nor where *Relaxation* does or may improve the *Distemper*, or do harm, as in *Apoplectical* and *soporose* Cases, as *Coma*, *Comos*, *Lethargy*, &c. *Weakness* of *Memory*, *Stupidity*, *Morosis*, *Nightmare*, *Drunkennes*, &c. *Syncopes*, and *Faintings* from *Relaxation*, as the original Cause ; as from *Excess* of *Joy*, *Pleasure* : *Large Evacuations* when

when the Parts cannot well, and duly contract upon what remains, as after *Child-Birth*; profuse *Hemorrhages*, *Tapping*, (or *Paracentesis*,) or any large *Evacuation* of *Humours* in *Dropsies* of the *Belly*, *Breast*, or *Head*; nor (as has been hinted) in *Dropsies*, tho' without any such *Evacuation*, unless it be upon some special *Consideration* of the learned; nor in *Tremblings*, or *Shakings* of the *Head*, or *Hands*, &c. from *Weakness*, as in *old Age*: Nor in *Fluxes* from *Relaxation*, as too much *Sweat*, *Gonorrhæa Simplex*, *Diabetes*, *nocturnal Pollutions*, *Chylous Flux*, *Lientery*, *involuntary Flux* of *Urine*, or *Ordure*, and some sorts of *immoderate Fluxes* of the *Menses*, or *Lochia*, which owe their Cause to *Relaxation*; or *Aptitude* to *Abortion* from that Cause, and indeed generally in *Women* with *Child*, lest it should cause *Abortion* by relaxing the *Neck* of the *Womb*. Or where *Contraction* is beneficial, as to empty a foul or replete *Stomach*, *Choler*, &c. by *Vomiting* or *Stool*, or an ill *Humour* any way. Therefore

II. *Opiates* are not convenient when grievous *Sensations* are useful, as to excite *Expectoration* when *Matter* threatens *Suffocation*, in *Vomicas*, *Pleurisies*, *Peripneumonias*, *Consumptions*, *Spitting of Blood*, &c. When *Hunger* calls for *Food*, and *Restauratives*; that of *stuffing* at *Stomach* excites *Vomiting*; that of *Urine* solicites us to a due *Excretion* thereof; that of ill *Matter* at *Guts* causes an *Evacuation* thereof; so that when a *Crisis* is to be by the *Help* of grievous *Sensation*, or *Irritation*, *Opiates* are not convenient, for it takes off the *Sense* of *Irritation*; but when a *Crisis* is to be by *Relaxation*, as by opening the *Pores* to cause *Sweat*, *Perspiration*, &c. then is it of excellent *Use*: So, that great *Question*, (that has very much puzzled the learned) whether *Opium* is convenient before a *Crisis* &c? is plainly, and mechanically answer'd.

III. *Opiates*

III. *Opiates* are not convenient where *Tuillation* by the *Acrimony* of volatile *Salts* is the Cause of the Disease, as in troublesome *Erections*, *Priapisms*, Nocturnal *Pollutions*, *Venereal Furies*, too much *Salacity*, and *Tuillation*, *Itchings* of the *Uterus*, *Scrotum*, *Penis*, *Skin* in general, &c.

IV. I scarce need tell any, that *Opiates* are inconvenient when the *Meconium* of Children should be evacuated; or when one is bound in *Body*, or apt to be so; but there may be a *Time*, when the learned *Physician* may think fit, to give them even to the *Coffine* in urgent Cases, for he can order somewhat along with them, or soon after, to open the *Body*; who may also see Cause sometimes to vary from these general *Rules*, when *Necessity* and good *Reason* direct him so to do, tho' they are nevertheless general in their *Nature*, and not to be transgressed without special Cause, and mature *Deliberation*.

V. *Opiates* are not so convenient where there is much slimy, moist, and phlegmatick Humours, by Reason that the Parts are subject in such Cases to be too much relaxed.

I have been the fuller (especially upon the Head of Diseases) that I may hereafter have nothing to do, but to shew the beneficial Use of *Opiates* duly prepared, more particularly of the *Panacea*'s of *Opium*, of which I am going to speak.

C H A P. XXX.

The Method contriv'd to shew the Use of well-prepared Opiates (more especially the Panacea of Opium.)

HAVING shewn the *Nature and Principles* of *Opium*, which produces the good, which the bad Effects; *how and why* they do so; *how* to separate, subdue, and correct the *bad Principles*; the due *Doses* of good *Preparations*; *how* to cure all the ill Effects of *Opium*, and *general Rules and Cautions* concerning it, and in what Cases it may not be convenient; I have now nothing to do but to shew the *beneficial Use* of the *Panacea*, (or well prepared Opiates.)

To make it more agreeable to *rational Minds*, and fix its *Uses* better in *Memory*, I will so proceed by its *Effects*, that the very Title of every Chapter may imply the Reason of its *Use*, which is either *internal* or *external*, and both of them either,

I. As it is a *Pleaser of Sensation*, (or an *Opiate* specially so call'd) by which means it produces all the *good Effects* that are notoriously observed, which are mention'd in *Chap. 4, 5, 6.* Or,

II. As it is an *Alterative of the Bloud, &c.* which is all Improvement, because almost wholly disregarded, and never brought into any *Method* to this day, tho' it is the far nobler *Use*, by how much *Curing* excels bare *Pleasing*, or *Palliating*, tho' these last *Uses* have already rendred it the most *general Medicament* that is in being, insomuch that *Sylvius* said, having only respect to this *Use*, That he had rather not be a *Physician*, than not know the *Use* of *Opium*.

III. As

III. As an *Evacuative* by relaxing and opening the Pores.

Its *Effects* and *Uses*, as a *Pleaser of Sensation*, are fairly reducible to these general Heads, viz.

1. Its *comforting, gratifying, encouraging, and invigorating* of the *sensitive Soul* and *Spirits*.
2. Its *composing* the *sensitive Soul, Spirits, &c.*
3. Its *relaxing* all the *sensible Parts* of the *Body*.
4. Its *causing Sleep*.
5. Its *causing Indolence*, or taking away *Pain*.
6. Its *stopping Fluxes*, that depend upon *Irritation, grievous Sensation, Contraction, &c.*
7. Its *promoting Fluxes*, that depend upon *Relaxation*.
8. Its *causing Titillation*.
9. Its *causing Vigilancy* (or *Watching*) in some *Persons*.

Its *Effects* and *Uses*, as an *Alterative*, are,

1. To *invigorate Nature*, or the *sensitive Soul, and Spirits*, which are the *Principles* of all *Motion* and *Alteration* for the *Preservation* of the *Animal*.
2. To *give Nature*, or the *sensitive Soul*, an *Euphory* in that *Work* of *Preservation, Alteration, &c.*
3. To *administer fresh and most agreeable Principles* for that *end*.
4. To *administer such* as are more *vigorous* and *powerful* than our own, in order,
5. To *resolve all ill Humours*, as *vigorous* and *agreeable Menstruums* do.
6. To *compose, combine, concentrate, or unite the good and agreeable Parts* of those *Humours*, and by its *Agreeableness* to join with them, and cause a *strict combination* of *Parts*, to *intercede* and (as it were) *cement* them.

7. To discuss the separated and effete Parts of those Humours by its brisk Volatile Salt. And,

Its Effects and Uses, as an Evacuative, are,

1. To cause a liberal Perspiration, to give those effete Parts their Exit in the most natural, plentiful, kind, and universal manner.

2. To cause Sweat, when there is sufficient Matter for that end.

3. To relax and open the Pores for the Menses and Lochia, &c.

C H A P. XXXI.

Of the Use of the Panacea, or well-prepared Opiates, to comfort and invigorate the sensitive Soul and Spirits.

I Have shewn how and why it causes a blithe, gay, and good Humour, Serenity, Ovation of the sensitive Soul and Spirits, Alacrity, Promptitude, Assurance, Courage, Magnanimity, Euphory, or easie Undergoing of Labour, Journeys, &c. It therefore follows,

1. That it must prevent or take off Sadness, Melancholy, Cloudiness, Slowness, Dulness, Listlessness, Laziness, Bashfulness, Cowardise, Fear, Pusillanimity, Lassitude, Distresses, Anxieties, Solitude, and all such grievous Passions, as *Wine ad Hilaritatem* does.

2. That by fortifying the sensitive Soul and Spirits, it must prevent contagious Infections, and mightily enable and invigorate Nature to subdue and conquer what is inimicous to it in all Respects.

3. That it prevents and takes off Faintings and Leiptbymies that happen from the aforesaid Causes, as those upon Fear, Terrour, hard Labour, being Plague-struck, and the like.

I. The Form that it is to be given in is indifferent, unless a very sudden Effect is required, as may happen in Fainting Fits, &c. for then (as was said) a liquid Form in Wine, or hot Cordials, is best.

II. The

II. The *Dose* in these Cases must be moderate, and sometimes, in great Cases, the highest; for great Grievances cause proportionable defensive Contraction, which opposes the good Effect of the *Panacea*, &c.

III. The *Vehic*le should be a Glass of generous *Wine*, cordial fermented *Liquors*, comfortable *Spirits*, or such-like; to which you may add (if you please) pleasant and comfortable Things; as, *Tincture* of *Saffron*, or its *Spirits*; *Chymical Oils*, as of *Cinnamon*, *Nutmegs*, *Sassaparilla*, *Cloves*, &c. (dropp'd into *Sugar*) *Ambergris*, *Musk*, &c.

IV. The *Time* of giving it, is at such a convenient distance before the *Time* that you would have it operate, that it may produce its Effects at the *Time* desired. See the *General Rules* as to *Time*.

When it is requisite to continue its Effects, as in long *Journeys*, or the like, repeat it as soon as you find the Effects of the former *Dose* begin sensibly to decay; because it takes some *Time* to operate.

V. The *Regimen*, when *Action* or *Business* is intended, is to keep in *Motion*, *Discourse*, or the like, lest you sleep or grow drowsie.

But when you intend *Sleep*, observe the *Regimen* directed in the *Chapter* of its Use to cause *Sleep*.

Tho' less *Sustenance* will serve when you use it, yet must it not be omitted in a moderate manner.

The *Kind* must be such as is easie of *Digestion*, and apt to promote *Perspiration*, as light *Bread*, *Mutton*, *Lamb*, *Neat's-Tongue*, *Sweet-breads*, and *Lamb-stones*, with agreeable *Sauces* that may help

Digeſtion and Perſpiration ; which is a great Cauſe of *Serenity* and *Alacrity*, (as *Sanctorius* obſerves) becauſe that thereby *Fumes* and *Vapours*, which cloud and clog the *Spirits*, are evaporated, and the *Spirits* become ſerene and expedite.

It is to be obſerved, That *Parsly*, *Sellery*, *Onions*, *Horſe-Radiſh*, *Garlick*, and ſuch warm and volatile *Plants*, promote *Perſpiration*.

Your *Drink* ſhould be good *Stomach-Wine*, or *Wine* and *Water*, or fine clear *Drinks*, not too new.

1. *Note*, That (as has been intimated) drinking good, acceptable, and generous *Wine*, ſo often (yet moderately) as to keep a continual Senſe of its *Pleasure* at *Stomach*, is the beſt Substitute to it that can be uſed ; for it will thereby answer much of the permanent Effect of well-prepared *Opium*, tho' not quite ſo convenient in many *Reſpects* ; as, 1. Becauſe it muſt be ſo often repeated. 2. Becauſe its Effect is not ſo fine and charming. 3. Becauſe the *Wine* heats more. 4. Becauſe it waſhes the *Stomach* too often, and the like.

2. *Note*, That when People are in an untoward Condition, or (as they call it) out of *Sods*, the next day after *Drinking*, Men often adviſe taking the Hair of the ſame Dog, (that is, drinking ſome of the ſame *Wine* or *Liquor*) it is beſt for them to uſe it as I juſt now directed ; for their Caſe (upon the good Effect of the *Wine* ceaſing) is much like that upon the going off of the Operation of *Opium* ; which may alſo (in this Caſe) be uſed inſtead of *Wine*, to procure a better and blither Condition for that day, that uſes to be very troubleſome to *Drinkers*.

3. *Note*,

3. Note, That good Preparations of Opium may be conveniently used to Horses, to prevent their being tired, or take off their Weariness, and cause them to go on; but I would not advise any Preparation in this Case but the *liquid Panacea* in good Ale or Beer, and that only in the same Quantity as is used to Men, till farther Experience emboldens the Practice: By such means, (I cannot doubt it) any Fade may be made to appear lively, go well, &c.

C H A P. XXXII.

Of the Use of the Panacea, &c. to compose the Sensitive Soul, Spirits, &c.

I Have shown how and why it composes and quiets the sensitive Soul, Spirits, Blood, Stomach, &c. and by that means allays all the Fury, Commotions, Perturbations, and turbulent Exorbitances thereof, and that often without Sleep, but much better with it. It follows therefore,

1. That it prevents and takes off all Frets and turbulent Passions of the sensitive Soul; as, Anger, uneasie Agitations, and Tosses of the Mind, Peevishness, Fretfulness, Discontents, Disquietudes, Dissatisfactions, Murmurs, turmoilings and vexatious Thoughts, Anxieties, Sollicitudes, &c. and all the evil Effects thereof; as, Watchings, Waste of Spirits or Strength, Lassitudes, Hypochondriacal Melancholy, Cachexies, Scurvies, &c. But these last belong most properly to its Alterative Faculty or Vertue.

2. All involuntary furious Agitations of the sensitive Soul and Spirits; as, Madness, more especially Melancholy Madnesses, or such as proceed from grievous Thoughts or Apprehensions, Losses, Crosses, Despair, Fears, Terrours, or the like; but they are not so good in Merry Madnesses, as those from Joy, Venereal Fury, and such-like, which answers the great Disputes about Opiates in Madnesses, Deliriums, Epileptical Fits, Convulsions general and particular, as those of the Head, Rising of the Lights, Vomitings, Hiccoughs, Sabbing,

blings, Keckings, Convulsive Asthma's, Palpitations, and Tremblings of the Heart, Shakings and Shiverings upon Fear, Terror, Cold, Pain, Ague-Fits, Convulsive Colicks, Hysterick Fits, Iliack Passions, &c.

3. All Fevers and Frets of Humours that happen from any of the aforesaid Causes; Or from any violent Motion, voluntary or involuntary, as Labour, Running, Hewing, Fighting, or any vehement Exercise, Ratlings, Tossings, Concussions in Coaches, Waggon's, Boats in stormy Weather, violent Riding, &c. Or from Heat of Fire, Sun, Baths, Hot-Houses, Bagnio's, Crowds, lying too many in one Bed, or with too much Clothes; Or from grievous Sensation, Irritation, or Pain, as Fevers upon Inflammations, Abscesses, Buboes, Stone, Colick, Cardialgia, Wounds, Fractures, Dislocations, Contusions, Amputations, Lithotomy, Paracentesis, or any painful Operation of the Noble Art of Chirurgery; Agony, or Pain of the Small-Pox, as its second Fever, and the like: Or from Fluxes, as tedious and turbulent Vomiting's, Diarrheas, Dysenteries, Cholera's, Iliack Passions, artificial Purgings, and all symptomatick or immaterial Fevers whatsoever, which either never had any Matter, but proceed from such agitating Causes as I mentioned, or remain (as some do) after the grieving Matter is carry'd off by Vomiting, Purgings, &c.

I forbore mentioning Pleurifies and Peripneumonia's among the Fevers, that it prevents or takes off, because there are great Disputes whether Opium is convenient in those Cases, which I hope to determine.

Unless it be when the said Distempers are come to that pass, that it is dangerous to cause Sleep, or take away any of the Sense of the Irritation of the Matter to be expectorated, lest it

should be too much amass'd in the *Bronchias*, or Wind-pipe, and so choak the Person, I see no cause to forbid them any more than *Sleep*, or *Opiates*, in other *Inflammations*, wherein they are highly beneficial, to give *Ease*, cause *Sleep*, compose the *Spirits*, and take off, or at least moderate the *Fever*.

But I see many good *Reasons* to use them :
 1. Because, as a *Sal-Volatile-Oleofum*, they reiterate and resolve clammy *Humours*, and are so agreeable in Principles (as *Menstruums* should be) to the thing to be resolved ; I cannot doubt but *Red Poppy* is, upon *Experience*, stated a *Specifick* in those *Cases* for that reason. 2. Because these *Distempers* (as *Hippocrates* speaks) are from a segregation of *Humours* by *Agitation*; &c. and *Opiates* excellent *Composers* thereof. 3. Because they are such great *Discussers* ; and, 4. Open the *Pores* to let the discuss'd Matter quite out of the Body. 5. Because it may be that by its *Relaxation* upon such *Resolution*, the lodged Matter may be caused to flow off, and circulate again, and so be graduated, discuss'd, and carried off by the open *Pores*. 6. Because it enervates Nature to perform those Things ; And, 7. Gives *Ease* and *Recruit* of the *Spirits* by *Sleep*. So that all Things considered, I think (as *Experience* assures us) that *Red Poppy*, or *Opiates* in due *Quantity*, are the very best *Remedies* that can be used. Hence it is that

Wedelius calls *Opium* an *Antipleuritick Specifick*, he having observed, (as I and others have done) That the whole *Course* of the *Disease* and *Expectoration* will succeed much better by their *Use*. He adds also, That he has very often cured them by its help, without letting of *Bloud*; which is an

an infallible sign of their good Effect, since the Pleurisie can hardly be cured without Bleeding. I cannot see how an Effect that bears such Analogy to Sleep can do any more Harm than Sleep.

Etmuller also advises the giving of Opiates not only in the Beginning, but also during the Increase of the Pleurisie or Peripneumonia: So that I conclude, That they are of excellent Use in those Diseases, unless it be when Sleep or them may cause too much Insensibleness of the Bronchias, and so retard Expectoration, when the Case is such that the Want thereof may endanger the Person's being choak'd.

We have also many Histories of Persons cured in other Fevers by large Doses of Opiates. I suppose that resinous Opiates causing Vomiting and great Disturbances, by reason of ill Digestion in those Cases, might be one great Cause of People's Fears and Jealousies in giving Opiates, which is easily prevented by giving liquid Opiates void of any resinous Particles, as the liquid Panacea, &c.

4 It does, by composing, quieting, and appeasing the Motion and Perturbation of the Blood, conduce much to the stop of its Efflux in Hemorrhages (or Bleedings) that are unnatural; as at Nose, in spitting and vomiting of Blood, bleeding at the Hemorrhoids, in Dysenteries, pissing of Blood, &c. and sometime in profuse Menses, when they happen from a Fever, or too much Motion of the Blood and Spirits, and not an over-Relaxation or Dilatation of the Pores, which must be well distinguished.

I. The Form must be liquid in all Fevers, and is also most convenient, generally speaking.

II. The

II. The *Dose* may be the moderate, or midling, except it be where the *Pains* are great, or where much of the *Opiate* is lost, as in *Vomiting*, *Loosness*, &c. for which see the *General Rules*.

III. The *Vehicle* should be (generally speaking) cooling, composing, and incrassating Liquids, as *Emulsions*, *Milk* and *Water*, or the like; but in settling the *Stomach* use agreeable warm and comfortable Cordials, or *Wine* burnt with *Aromatics*, or the like.

IV. The *Time* is, when 'tis convenient according to the *General Rules*, and your *Intention* of its Operation; therefore where there are *periodical Paroxysms*, or *Exacerbations*, as in the *Small-Pox* and many *Diseases*, in the *Afternoons*, or towards the *Evenings*, give it the due *Time* before, that it may have its full *Effect* by the *Time* the *Paroxysms*, or *Exacerbations*, are expected to begin, and be not so mad as to be regulated by *Night*, or *Day*, or *Bed-time*, &c. (as is usual) which are no *Symptoms*, *Signs*, or *Effects*, of the *Distemper*, but of the *Motion* or *Position* of the *Sun*, *Stars*, &c. which are not the *Subjects* of your *Cure*, nor can be: The *Want* of which most obvious and rational *Practice*, has sadly disappointed inconsiderate *Physicians*, and often hazarded, if not destroyed the *Patients*.

V. The *Regimen* is the same as that to cause *Sleep* which you have in *Chap. 35.* and should be by all means used in this *Case*.

1. *Note*, That *Opiates* are not to be used (as has been intimated) where the *Commotion*, *Flux*, &c. is for apparent and speedy *Benefit* of *Nature*, as in *Vomiting* upon *Repletion*, or to discharge the *Stomach* of somewhat that offends it, or a *Loosness* to clear the *Intestines*, or the like.

2. *Note*,

2. Note, That when any *Evacuation* is to be made by *Vomit* or *Stool*, the best way in these Cases is to use large *Dilutions* of some contempering Liquid, instead of *Vomitories* and *Purgers*; therefore use only lukewarm *Water*, or (which is best) boil'd with a little *Carduus* in't, or *Carduus-Passet*, or the like, to cause *Vomiting*; and more agreeable *Dilutions* for the *Intestines* to wash off ill *Humours*, as a Gallon of *Water*, with half an Ounce of Cream of Tartar, or rather the purging Salt of the *Waters* dissolved in it, or some part thereof, using all cold, or but very little warm'd, giving the *Opiate* or *Panacea* immediately after the Person has done *Vomiting* or *Purgings*, in a small Glass of *Wine*, or agreeable *Cordial*, to warm and comfort the *Stomach* and *Intestines*, which, because of the smallness of the *Quantity*, the Moisture and Coolness of the diluting Liquids and the *Opiate*, can cause no *Inconvenience* by its inconsiderable Heat.

C H A P. XXXIII.

*Of the Use of the Panacea of Opium, &c.
to relax.*

HAVING shown, that Opiates relax all the sensible Parts of the Body, and how, and why ; it follows that they are of excellent Use,

1. To prevent and take away all Contractions that happen from grievous Passion, or Sensation, (or Pain) as Convulsions, Shiverings, Shakings, Cramps, Tensions, Palpitations and Tremors of the Heart from Fear, Terrour, Grief, Melancholy, Anxiety, Solitude, Anger, Fretfulness, Concern, Surprize, &c. Or from Cold, Pain, Acids, &c. as Contraction of the Sphincter of the Bladder from those Causes, by which the Urine is often stopt, as also by the Pain from the Hæmorrhoids, Inflammations, Small Pox, Colicks, Acrimony, Excoriation, &c. (which often hinder the making of Water, as they also do sometimes going to Stool, swallowing, &c.) Shivering in Ague-Fits ; Stupors from Cold, or Pain which (as was shown) proceed from a violent Contraction ; in all which it will scarce ever fail of due Effect : by this Means you may (as I have often done) cure those Disasters safely, speedily, and pleasantly even to a Wonder and Amazement, (as if charm'd by a Spell) when others know not what Hand to put to them, and are quite baffled thereby.

By the same Means (tho' little, or not at all minded) you may prevent great Tumours upon Pain ; as when by a Thorn, or any grievous Pain the Arm, Legs, Thighs, &c. begin to swell ; for the

the Swelling, which often grows prodigiously, and seizes the whole *Limb*, if not a great Part of the *Body*, threatening and often causing Mortifications and Death it self, is caused by the *Pain* contracting, and so girding the Parts, that the *Bloud*, *Lympha*, &c. cannot pass, by which Means the Humours being stagnated, and crowded in by the Force of the *Arteries*, and dam'd up by the *Contraction*, most dreadful *Tumours* happen; whereas the *Pain* being taken away by the *Opiate*, and all the Parts relaxed, they are, and must be prevented by plain *Mechanism*, if used timely. For *Pain* can cause *Tumours* by no other Means besides *Contraction*, which *Opium* must prevent by taking away the very *Pain* it self.

2. To help the Cure of all other *Contractions*; as *Tensions*, *Rigidities* of *Nerves*, *Membranes*, *Tendons*, *Ligaments*, *Muscles*, &c.

3. To relax, or make way for Things to pass, as *Sweat*, *Fumes*, *Small Pox*, *Measles*, *pestilential*, or *venemous Effluvias*, *Menses*, *Lochia*, and the like, to pass through the *Skin* or *Pores*: A *Child*, dead, or alive, *After-birth*, *Mole*, *clodded Bloud*, &c. to pass through the Neck of the *Womb*, when too narrow by *Nature*, or contracted by *Pain*, *Cold*, *Terrour*, &c. A *Stone* to pass the *Ureters*, or Neck of the *Bladder*, by taking away the *Pain* that contracts them and hinders the Passage of the *Stone*; so that (in the Hand of an ingenious *Physician*) there is not a better, nor as good a *Remedy* to cause a *Stone* of any passable Bigness to come away, for it passes through the relaxed or widened *Passages* without *Pain*; to help which, other *Relaxers*, as *Warmth*, *emollient Baths*, *Fomentations*, *Clysters*, together with slippery and emollient Things inwardly taken, and at last a great Stream of *Urine* well contrived and timed when the Parts are most relaxed, suppled and lubricated, do much conduce I would

would have all who are troubled with the Stone
Note this.

Note also, That to hold and dam up the Urine a long Time, is of excellent Use well managed, when the Stone is in the Ureters, because when the Urine has fill'd up the Bladder very tightly, that it will receive no more, it must distend the Ureter, which is the Cause that very many are eased, either by the removal or discharge of the Stone after a set Time, which gives Occasion to call them Fits of the Stone, because they last for much about the same length of Time; however, the large and sudden Evacuation of Urine must, by leaving the Part loose, &c. conduce very much to the Passage of the Stone, Clods of Bloud, Pblegm, Matter, &c. that stops the Urine.

4. To relax, or make Way for Things to be put into the Body, when there is Occasion, as in Reductions of Hernias (or Ruptures) of a fallen Fundament, Womb, or Vagina, in which Cases it is of neat Use, both by relaxing, and taking away Pain during the Operation. It may be also of Use when the strictness of the Collum Uteri hinders the Admission of Sem. viril. both as a general Relaxer, and as causing greater Pleasure of those Parts, and a proportionable Relaxation thereof; for it is by the Pleasure in Coition, that the Collum Uteri is opened, or relaxed, (as is observed) which immediately closes again, when the sense of Pleasure is ended; yea and so much the stricter, because the Loss of Pleasure is (as was shown) a Kind of Grievance; hence it is, that *omne Animal post coitum est triste*; and not because of loss of Spirits (as is vulgarly imagined) for we can lose little or no Spirits by that which is so separated for Excretion before-hand, as the Semen is.

5. To

5. To enlarge any Part for the due Reception of what is convenient, or necessary, as the Breasts to receive Milk, (by which Means it comes to be such a great Increaser of Milk) The seminal Vessels, (as Sem. virile. does upon Puberty) to receive the Semen: Thus it causes the Penis to grow, as the Semen upon Puberty causes it, and Cocks Combs, Turkey-Cocks red Bags at the Neck, Proboscis, &c. to grow at the Time they are fit for, or begin to tread; for the Relaxation caused by the Pleasure of the Semen makes the Party more capable of the Nutriment. Thus it is, that Sleep causes the Growth, Fatning, and Thriving of Animals, and red Noses to grow so large by frequent Relaxation upon the Pleasure of Wine, Ale, &c. (as was said) to which Quantity distending the Parts may in the last mentioned Case contribute.

I. The Form of Opiates in this Case may be either solid, or liquid, as you think fit.

II. The Dose must be proportioned to the Relaxation that you desire; for more relaxes more; and less, less; so must it be also proportioned to the Contractions, that it is to take away; therefore very grievous Passions, or Sensations, which cause proportionable Contractions, require greater Doses, because their Grievance and Contraction do strongly oppose the Pleasure and Relaxation that Opiates cause; therefore great Pain (as you'll find in its due place) requires an extraordinary Dose.

III. The Vehicle in Contractions from grievous Passions should be Wine, or some comfortable Cordial; except they be the more turbulent Passions, as Anger, Fury, &c. where Composers, as Emulsions, Milk, and Water, &c are best.

In

In all other Cases, emollient and suppling *Vehi-
cles* are most proper, as soft, smooth, and slippery
Decoctions, Broths, &c.

IV. The Time to give them is, at the due Di-
stance before Bed Time, when the Intentions are
consistent with Sleep, which it self is a great Relax-
er; otherwise any Time will serve, as Occasion
or the Intention of the Physician requires it.

V. The Regimen.

1. As to *Meat and Drink*, is using moist, emol-
lient and lubricating Things, as smooth Broth,
somewhat fat; butter'd Roots, Herbs, Sawces,
Gruels, Milk-Meats, young Flesh, as of roasting
Pigs, Veal, Lamb, &c. Smooth Drinks as Ale,
Whey, &c.

2. As to sleeping and waking; that relaxes, and
this contracts; therefore, that conduces, this hin-
ders.

3. As to Rest and Motion; that relaxes, and this
contracts.

4. As to the Passions of the Mind; the Pleasant
as Mirth, Joy, Pleasure, Comfort, and all such,
do relax; and the Grievous as Terror, Fear, Grief,
Melancholy, &c. contract, as Pain does.

5. As to Air, the warm and moist, or that when
the Quicksilver is low in the Barometer (or VVeat-
her-glass) does relax; as do warm Baths Fomenta-
tions, &c. especially if emollient: Dry and cold Air
and that when the Quicksilver is high, do cause Con-
traction.

6. As to Excretion, and Retention; generally Ex-
cretion does make Room and Way for things to pass
through, or into the relaxed Parts, (as Clystering
for Passage of the Stone, Child, Reduction of Her-
nia, &c.) But be sure not to make the Excretions
grievous, because all grievous Sensation causes Con-
traction.

CHAP.

C H A P. XXXIV.

*Of the Use of the Panacea of Opium, &c.
to take away Pain or grievous Sensation.*

THIS it does (as was shown) by diverting the *sensitive Soul*, and introducing a Sense of *Pleasure*, which, (being contrary to *grievous Sensation* or *Pain*) cannot be in the same *Subject* with *Pain*; but chiefly, and *mechanically* by relaxing all *Parts*, and permitting the springy *Animal Spirits* to expand, and so become unfit to carry *Impressions* smartly; which is requisite to cause a sense of *Pain*. (as has been proved.)

Therefore it is of most happy and glorious Use in all *Pains*, but especially to be used

1. In such as are not for any Benefit to the Person pain'd, in Order to alter, or evacuate the grieving Cause, as in *Pocky*, *scorbutical*, or *hypochondriacal Pains*, or such as proceed from any ill *Habit* of *Body*, &c.

2. Where Pain hinders the taking away of its Cause or some Benefit; as when the Pain of the Stone does by contracting the *Parts* hinder its own *Passage*; that of a *Tenesmus* hinders going to stool; that of the *Sphincter* of the *Bladder* hinders its opening to let out *Urine*, *clodded Bloud*, *Phlegm*, *Matter*, or any such Thing; when that of the Neck of the *VVomb* hinders *Delivery* of a *Child*, *After-Birth*, *Mole*, *clodded Bloud*, &c. that of the Mouth of the *Stomach* hinders *Vomiting*, when requisite; or that of the *Pylorus* hinders the *Detrusion* of *Chyle*; or that of the *Intestines*, as by an *Inflammation*, &c. stops

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the

the Passage of the Ordure, and causes an *Iliack Passion*; or that of the *Gullet* hinders *swallowing*; of the *Larynx* Breathing; or that of any Part hinders *Perpiration* or desired *Sweat*; or that of the *Venerable Parts* stops the *Menses*, or *Lochia*, &c. In all which Cases it is, and must in all Reason be of excellent, and (if duly managed) of almost (if not altogether) infallible Effect, by taking away the Pain which causes the Part to contract, and make the Stop, &c.

3. Where the Cause of the Pain cannot be removed but by *Perpiration*, *Sweat*, *Menses*, *Lochia*, or *Urine*; as in Pains in the Habit of the Body, Limbs, &c. From Cold, Wind, or Vapours, Gout, Rheumatisms, Stitches, Pleurishes, Inflammations, and many of the Cases aforementioned, it is excellent: As it is

4. Where the Pain, Irritation, or grievous Sensation, causes Nature to work irregularly, as in *Iliack Passions*, *hysterick Fits*, *Fruitless Convulsions*, *canine Appetite*, &c. In which Cases it excels all other Means for many Reasons.

5. Where the Pain is not likely to have a timely Effect for good, till People may be too much worn out.

6. In all Pains that have not any material Cause from the Humours, &c. of the Body, as such as happen from Passions, Wounds, Pricks of Nerves, Tendons, Fractures, Dislocations, Amputations, severe Chirurgical Operations, &c.

7. In all Pain from Inflammations, Suppurations, Abscesses, Tumors where Repulsion is not convenient or possible.

8. In all Pains that are more likely to cause Fevers than any Benefit, as in many of the former.

To be short, it is good and useful in all Pain and grievous Sensations.

1. Except all such as tend to the speedy and timely Benefit of Persons, as those in *Womens Labour*;

hour; Grievances at *Stomach*, that cause Vomiting upon *over-Repletion*, or by Reason of somewhat that grieves, and is not convenient to stay at *Stomach*; or Irritations to expectorate, when much wanted, as happens sometimes in *Vomicas*, *Pleurisies*, *Peripneumonias*, &c. Or such as irritate, and sollicit to make Water, go to Stool &c. When Evacuation of *Urine*, *Ordure*, ill *Humours*, &c. is requisite.

2. Except when grievous Sensations are necessary Calls or Intimations for Supply, Refreshment, &c. as Hunger, Thirst, &c. which should be taken off only by the Pleasure of good Meat, and Drink; lest Nature be defrauded: Where you may observe an Inconvenience, that may happen by the frequent Use of Opium taking away Appetite without Nutriment. Tho' this is much compensated by the Relaxation, and Recruit, that Opiates give, and their moderating the Expence of Spirits by taking of Contractions; and may more (if not wholly) by a regular and constant way of Eating and Drinking temperately at usual Times, tho' the Hunger may not, by Reason of the Opiates, be so great as at other Times.

I. The Form is indifferent, and to be ordered only according to the general Rules, remembring that the Liquid is best for Speed.

II. The Dose must be proportioned to the Pain, or grievous Sensation, and always rather more than when there is no Pain, because its Contraction opposes the Relaxation to be induced by the Opiate.

Observe this Method. First give a good Dose, then stay about 2 or 3 Hours, and if the Pain be not at all lessen'd, you may safely then give half the Quantity again, and afterward about a third Part of

the *Dose* every 2 or 3 *Hours* till it begins to abate; but upon the least sensible *Abatement*, you must forbear to give any more, because that which did in some *Measure* abate the *Pain*, does in the same *Proportion* abate the *Contraction*, and consequently it has less to contest with, therefore will be sure to conquer it; for the same *Power*, that could subdue ten in some *Measure*, will subdue nine in a greater *Measure*, and eight more easily than nine, &c. till the *Pain* quite ceases; whereas if you add more *Power* to the *Opiate*, it may be too much, especially when the *Pain* is thereby conquered, and that it has no *Contraction* to contest with; for then it will be as if a great *Dose* were given to one that had no *Pain*; but if the *Pain* increases again, you may safely repeat the *Half Dose*, &c. every 2 or 3 *Hours*, till it again begins to abate, and no longer; which you had better observe to do as soon as ever the *Pain* begins to return, because it takes some *Time* to operate; it follows then, that the *liquid Form* is most convenient in this *Case* for *Expedition*.

My particular and effectual manner of using it in the Gout, will be somewhat too tedious to be set down: Therefore since it may be obvious enough to the sagacious, that consider what has been said, and the Nature of the Distemper, I will pass that by at this Time.

III. The *Vehicle* in cold *Stomachs*, and *Constitutions*, may be a *Glass* of *Wine*, or some temperate *Cordial*; but in hot *Cases*, or where a *Fever* is feared, *Emulsions*, *Milk* and *Water*, or *Water* alone, or other acceptable cooling *Things*, or such as are directed in the *Case* of procuring *Relaxation* in the last *Chapter*; because it is *Relaxation* that takes away *Pain*, as has been *mechanically demonstrated*. But here there is no need of being scrupulous as to the *Vehicle*, unless it be in respect of *Heat* and *Cold*, as the *Case* happens.

IV. The

IV. The *Time* may be any *Hour*, as the *Case* requires; only remember, that *Sleep* conduces much to *Relaxation*, and therefore to the taking away of *Pain*.

V. The *Regimen* to be used in the *Case* of *Relaxing* in the last *Chapter* will suffice, but 'tis convenient (as was said) to regard the *Stomach*, and *hot* and *cold Constitutions*; especially where there is any *Fear of Fevers*; by giving cooling *Liquids*, as *Emulsions*, &c. and avoiding *hot* or *solid Things*, especially such as are hard of *Digestion*, as *Flesh*, *Fish*, *Eggs*, &c.

1. *Note*, That it is very advisable, not to defer the *Use* of *Opiates* too long, till *People* are very weak, tho' it may seem that they would hinder some due *Evacuation*; for I cannot see what *Harm* a *Refreshment* by them may do, any more than by *Sleep*, both depending upon the same Cause, viz. *Relaxation*: It is true, that by *Reason* of *Sleep*, or an *Opiate*, the *Evacuation* may be a little defer'd. What then? would any *Man* deny *Sleep* for that *Reason*? Why then should a *Physician* deny an *Opiate* to cause it, respite *Nature*, and enable it to bear its *Burthen*, or engage with *Difficulties* the better?

2. Remember always that *Sleep* is a great *Help* to take away *Pain*, and so are all *Things* that conduce to *Relaxation*, or pleasant *Diversion*.

3. Use *Means* in *Pain* of the *Hemorrhoids*, *Fundament*, or *Intestinum rectum*, and indeed in any *Pain* within the *Guts* (unless it proceeds from a *Looseness*) that *Opiates* may not bind *Men* too much; as *Lenitives* internally, or *emollient Clysters*, or which of them may be most easily and conveniently done, and most to the *Purpose*.

C H A P. XXXV.

*Of the Use of the Panacea of Opium, &c.
to cause Sleep.*

IT primarily causes *Sleep* by relaxing and composing, quieting, soothing, pleasing, and lulling the *sensitive Soul* and *Spirits*; it always relaxes, but does not always sufficiently compose or quiet the *Spirits* to cause *Sleep*, to which both are requisite: *Secundarily*, by taking away *grievous Passion* or *Sensation*, when they happen to hinder it.

1. *As Soporiferous*, it is of incomparable Use in all troublesome Watchings, whether they be from grievous *Passion* or *Sensation*, or irrequiete Motion of the *Spirits*, tho' not so certain in this last Case as in the former; and therefore proves sometimes unsuccessful in some Persons, and in some sort of Madresses, as the Merry or Furious, tho' it is effectual in Melancholy and slow Manias, (as has been intimated) for bare Relaxation suffices in the Two first Cases, where *Sleep* is hinder'd by Contraction, which it never fails to take off, if given in a due Quantity, as has been directed.

2. To recruit the *Spirits*, as when People are tired with Labour, Journeys, Diseases, Conflicts of Nature, as by Convulsions, Vomittings, Purgings, Hysteric Fits, and the like.

3. To relax, compose, take away Pain, moderate Fluxes that depend upon grievous Sensation, (or Irritation) and its consequent Contraction; or from Motion or Segregation of Humours.

4. To

4. To promote *Fluxes* that depend upon *Relaxation*, as *Perspiration*, *Sweat*; as also the *Menses* and *Lochia* in some Cases; of all which you have particular *Chapters*, which see.

I. The *Form* may be indifferently, either *solid* or *liquid*, as 'tis best liked, and most suitable to *People's Minds*, *Palate*, &c.

II. The *Dose* moderate, except it be, 1. Where some by *Accident* require otherwise, as *Pain*, *Loosnesses*, *Vomitings*, and to titillate the *Venerae Membranes* because remote; which see in the *respective Chapters* of the *Use of Opiates* in those Cases. 2. Where the *general Rules* direct otherwise, as in the *soft fleshed People*, *Children*, *Women*, &c. where the *Dose* must be less.

III. The *Vehicle* must be the same as is directed to *Compose*; but in *old People* 'tis observed, that *smooth Spirituous Things*, as good *Ale*, &c. conduce very much to cause *Sleep*, because *Sulphurs* do qualify the *Volatile Salt* of the *Opium* (as was shewn.)

IV. The *Time* in *general* is at the due distance before *Bed-time*, that is directed in the *general Rules*; but *Opiates* may be given at any *Time* when the Case requires, as in the *Small-Pox* about 12, 1, or 2 in the *Afternoon*, according as the *Exacerbations* (which happen in the *Afternoon*, or towards the *Evenings*) do seize them; and in *Agues*, at the due distance before the *Paroxysm* invades them; so that the *Operation* thereof may be full and compleat before the *Time* that the *Fits* are to begin; and so in all other Cases of the like Kind.

V. The *Regimen* in this Case must have a *Twofold Aspect*; 1. To promote *Relaxation*, 2. To compose and quiet *Motions* and *Perturbations* of the *Spirits*, *Bloud*, &c. *Relaxation* and *Quiet* being the *Two Causes* of *Sleep*.

As to the *first*, the *Regimen* must be the same as is directed in the *Chapter* of the *Use* of the *Panacea*, &c. to *relax*; but as to *composing* and *quieting* the *Spirits*, I shall add somewhat, tho' *Relaxers* are generally good for this Purpose, unless join'd with some agitating *Accidents*, as *Heat*, or the like.

1. As to *Diet*, it should consist of *cooling*, *incrassating*, *inviscating* Things, that are not *aromatick*, *acid*, or *saline*; such are *Milk-Meats*, *Emulsions*, *Almond Milks*, *Chicken Broth*, with *cooling Herbs*, *Water-gruel*, *fresh* and *young soft Flesh*, *Lettuce*, *Purslane*, *Spinage*, *Herb Mercury*, *Mallows*, and such like; *Mucilages*, as of *Quince*, *Fleabane*, &c. The *Drink* may be *Milk and Water*, *Whey*, or such *unfermented Liquors*, or *smooth Small Beer* not too old, for all *stale Drink* is naught; *Water* where it agrees, &c.

2. *Rest of Body and Spirits* must be contrived by all means, as by *leaning*, *lying*, or *sitting still* without any motion after it is taken, till *Bed-time*, and therefore let the *Person* (if the *Season* permits) be as much *undressed* as may be, in a *loose Garment*, or *Morning-Gown*, all that *Time*, and be help'd off with his *Cloaths*, that he may not agitate his *Body*; when *sleepy*, (and not before) let him go into a *cold Bed* in *Summer*, and but a little *warm'd* in *Winter*, and only have what *Bed-cloaths* suffices, and pleases him best, and then lie absolutely still without *Noise*, *Light*, or *Fire* in the *Room*.

3. *Rest and Tranquility of Mind* is very necessary, which should be not only free from *grievous Passions*, but from all *Excess* of *Joyous ones*, which too much agitate the *Spirits*.

4. The *Air* should be moist and moderate, and if not such by the *Weather*, render'd so by *Art*, especially in *Fevers*.

5. All

5. All *Evacuations* should be made, that may any way disturb his *Sleep*, before he betakes himself to it; nor should the *Stomach* be overfull or empty, lest any *Grievance* may be thereby created.

6. *Emollient tepid Baths, Fomentations, Foot-washes, &c.* do finely dispose People to *Sleep*, but take care they be not too hot, for heat causes a stir of *Bloud* and *Spirits*, which is an *Enemy* to *Sleep*.

1. *Note*, That long *Sleeps* after great *Fatigues*, or long *Watching*, ought not to be very frightful, if the *Dose* was moderate, and that the Person takes *Sustenance*.

2. *Note*, That old or dry Persons, or such as are very unapt to *Sleep* after *Opiates*, are often caused to *Sleep* by smooth *Wine, Ale, Cowslip Wine*, or the like, because the gentle *Oiliness* of such *Liquors* do correct the *Acrimony* of their *Volatile Salts*, and at the same time cause a Sense of *Pleasure*, which relaxes and causes *Sleep*. It has been observed, that even *Ambergrise* and *Musk* (which exagitate the *Bloud* and *Spirits*) cause old Men to *Sleep*, which happens by their fine *Sulphur* readily fastening upon the *acrimonious Volatile Salts*, as *Spirit of Wine* does upon *Sal Ammoniac*, which being mixed do soon coagulate: Therefore I am apt to think, that *Camphire* would be of excellent Use to correct the *Opium*, and the *volatile Salts* of the Body in such Cases, because it is Experimentally certain, that it corrects the *Acrimony* of *Urine*, of *Semen Virile*, *Cantharides*, &c.

3. *Note*, That the drier the Body is, the more unapt are *Opiates* to cause *Sleep*; therefore dry Bodies, as of old Men, *Hectical Persons*, &c. should be well moistened by *incrassative Moisteners*, as *Emulsions*, and such Things as are above-mentioned and ordered in the Chapter of the relaxing Use of *Opiates*.

From

From what is said, I do conclude, that *Opiates* do cause *Sleep* very readily where the *Oily Parts* abound; and that Things, that have a fine *Oleous Sulphur*, are very good *Correctors* of it, where *acrimonious Volatile Salts* abound, in order to cause *Sleep*; and that hence it is, that some ancient People will often Sleep better by the Use of the aforementioned smooth fermented sulphureous Liquors, than by the Use of *Opium*; from all which it appears, that *Sleep* is not such a Property of *Opium* as People make it to be, because, that besides relaxing, *Sleep* also requires a great Rest of the Spirits, and the sensitive Soul.

It seems very probable from the Premises, that *Anodyne Sulphur of Vitriol* would be excellent to cause old Men to Sleep; for it doubtless causes Sleep only by obtunding and qualifying our *Volatile Salts*, as *White Rosin*, and other *Balsamicks*, will often do.

C H A P. XXXVI.

Of the Use of the Panacea of Opium, &c.
to stop Fluxes.

IT palliates, moderates, and stops Fluxes; 1. By taking away the sense of the Irritation of Humours, which cause Contraction to squeeze them out, and promote their motion. 2. Because it composes and stills the motion of Humours by the Relaxation and the Sleep that it causes, which quiets motions. 3. Because thereby, and by its combining Agreeableness and Texture, it congregates the disgregated Humours. 4. Because the Relaxation suspends the Humours. 5. Because it discusses ill Humours. 6. Because the Pores being opened by the Relaxation, the Humours that caused the Fluxes are gradually perspired by that most natural and universal sort of Evacuation; for 'tis plain Reason and common Observation, that a plentiful Evacuation at Pores stops Fluxes per Anum, &c. and if it continues, perfectly cures them. Hence it is, that the Use of Opiates continued, does happily not only palliate, but perfectly cure Diarrheas, Dysenteries, Defluxions, Catarrhs, &c.

It therefore follows, that it is of great Use,

I. To palliate, moderate, or cure all Fluxes that proceed from Irritation of Humours, as Vomitings, Loosenesses, caused by the Humours of the Body, or Things given, as Diarrheas, Dysenteries, Artificial Purging, Iliack Passions, Cholera Morbus, (after the Humour is somewhat spent) Defluxions, Catarrhs, immoderate Spitting, Gonorrhœa Notha, (that is,

is, of slimy Humours by Reason of *Acrimony*) *Fluor albus* from the like Cause, or any other *Flux* of that Kind.

2. To moderate or cure *Fluxes* that proceed from too much motion of the *Bloud*, *Humours*, &c. as *Hemorrhages* at *Nose*, *Lungs*, *Stomach*, by the *Hemorrhoids*, *Pissing* of *Bloud*, *immoderate Flux* of *Bloud* by the *Menses*, *Lochia*, *Stool*, &c. when they proceed from that Cause, as may also some *Defluxions*.

3. To stop *Fluxes* that proceed (as *Hippocrates* says) from *Segregation* of *Humours*, by composing and combining them; from which Cause many such *Fluxes*, as I have mentioned, do happen.

But it is not advisable to use them in *Fluxes*, that are apparently, or very probably, for speedy and ready Benefit; otherwise (as was said of *Pain*) use them to respite *Nature*, which they do as *Sleep* does, nay, in many Cases, the Continuance of their Use may quite Cure them, for the several Reasons given in the beginning of this Chapter; What a pleasant Cure then do some refuse that reject them? leaving their *Patients* to be worn out with dismal *Pains*, tedious and profuse *Evacuations*, want of *Appetite* and *Digestion*, the common Consequences of *Diarrheas*, *Dysenteries*, &c.

I. The *Form* of *Opiates* in this Case should generally be *solid*, because it sticks better to its Work; whereas the *fluid* is more subject to be evacuated in *Diarrheas*, *Dysenteries*, and *Vomitings*, tho' sometimes the *Liquid* may be convenient in *Vomitings*, as when that *Form* is more agreeable to the *Stomach*, or that you would have a more speedy Effect, &c. In other *Fluxes*, where the *Opiate* is not liable to be evacuated too soon, it is indifferent what *Form* you use.

II. The

II. The *Dose* in *Fluxes*, where 'tis probable some Part of the *Opiate* may be carried off without *Effect*, as in *Vomitings*, *Diarrheas*, *Dysenteries*, *Choleras*, &c. the *Dose* must be (generally speaking) pretty large, otherwise a moderate *Dose* may serve; In such Cases due Consideration is to be had of what is lost by the *Evacuation*, at which you may easily guess in *Vomiting*, by what comes up, if its *Colour*, *Smell*, *Taste*, be observed, as also by the *Frequency* and *Violence* of the *Vomiting*, and noting how the *Stomach* clears it self of what is ingested by the *Quantity*; and lastly, by the *Effect*; of which, if what was given fails, more of the *Opiate* must be given by *degrees*, till it stops the *Vomiting* in some measure.

In *Loosenesses* give Half the first *Dose* every Four *Hours* till the *Flux* begins to be moderated, then be more wary in giving it, for what is afterward given may have its full *Effect*; therefore be very cautious, by giving but small *Quantities* both in this Case and in *Vomiting*, when they are moderated in some degree, because *Opiates* then have their full *Effect* without any *Diminution* or *Opposition* thereof.

In other *Fluxes* a moderate *Dose* may serve, as in *Defluxions*, *Catarrhs*, &c. however let the *Dose* rather incline to the highest than the lowest, and suffice (if possible) to cause Sleep, which is a great *Effect* in these Cases.

III. The *Vehicle* in *Vomiting* should be small in *Quantity*, pleasant, comfortable, and warming, lest you should by either *Quantity* or *Quality* give any offence to the *Stomach*; pleasing it answers the same *Intent* with the *Opiate* it self, and has often good *Effect* without *Opium*; for, indeed,
every

every Pleaser is proportionably an *Opiate*, and *Opium* is only such in an *intense* and permanent manner; therefore the *Vehicle* must be agreeable; as *Wine*, *Hippocras*, or *Wine* burnt with *Spices*, *Rosemary*, &c. or the best *Cordials*, or *Wine* with some *Ketchup*, *Caviare*, or *Anchovis*, or a little old *Cheese* dissolved in it upon the Fire, according as the Person likes one or the other; which last (tho' not used in common *Practice*) are of very great *Benefit*, where they are pleasing and well liked of.

In *Loosenesses*, such *Wines* and *Cordials* as are *subastringent* should be afforded (after the peccant Matter is evacuated) to comfort the *Bowels*; but the mentioned *Salt Things* are not convenient in this Case.

In *Defluxions*, *incrassative Composers* are the best *Vehicles*, as *Emulsions*, &c. See the *Vehicles* for *Composing*, for they are all proper in this Case also.

IV. The *Time* is, at any *Hour* when there is *Occasion*; but *Sleep* conducing, the proper *Time* will be (unless *Need* otherwise requires) at the due and directed distance before *Bed-time*.

V. The *Regimen*.

I. As to *Diet* in *Vomitings*, offer nothing to the *Stomach* but such Things, and in such *Quantities*, as was directed for *Vehicles*; only in *Vomiting*, before the grieving Matter is discharged, it will be often convenient, before the *Opiate* is given, to give good *Quantities* of innocent *Di-luters*, as luke-warm *Water*, plain or *Carduus-Possset*, between the *Vomits*, to dilate and render the

the Vomiting more easie; but when you would stop the Vomiting, use but small Quantities of such Things as are above directed for Vehicles.

Diluters in great Quantity do also succeed very well in Loosenesses, to wash off the ill Humours before the Opiate is given, and it is the best Practice that can be; but the Chalybeate Waters are the very best for that Purpose, (tho' Posset, or very thin Chicken, or Mutton Broth, are useful) for it answers all good Intentions, it dilutes and qualifies the peccant Humours, strengthens the Bowels, leaves a binding Quality after the Dilution is made, restores Appetite and Digestion, which are both much amiss in such Cases, and adds moisture to the Bloud, which is under a Fret or Febricula for want thereof, because all Liquids are carried off by Stool; but much of this goes to the Bloud, where it also washes off ill saline Particles; so that (believe me) it is of it self a most compleat and adequate Remedy in such Cases, if taken to 3 or 4 Quarts for 1, 2, or 3 Days.

1. Solid Meats, or Things hard of Digestion, must be avoided, because the Digestion is infirm, but Milks thicken'd with Rice or Flower, Rice Gruels, a light Bread or Rice Pudding, Gellies, Marmalet, a Tost out of Claret with Nutmeg, Cinnamon, and some Loaf Sugar, Emulsions, Almond Milk, Cheese-Cakes, Custards, and all sub-astringent Incrassatives are best, as also in all De-fluxions.

2. As to Sleeping, and Waking; that's good, and this bad.

3. As to Rest, and Motion; that is convenient, this not.

4. As

4. As to *Passions*, the *joyous* are convenient, the *grievous* not.

5. As to *Air*, the *dry* and *temperate* is best.

6. As to *Excretion* and *Retention*, what is said above is sufficient, saving that *Vomits* are very often convenient (especially if the *Looseness* is occasioned by the *Stomach*) to moderate it before the *Opiate* is given.

C H A P. XXXVII.

*Of the Use of the Panacea of Opium, &c.
to cause Fluxes or Evacuations, as Perspi-
ration, Sweat, &c.*

IT (as was shewn) promotes some *Fluxes*, or *Evacuations*, by relaxing and opening the *Pores*. Therefore,

1. *It is of excellent Use to carry away noxious Va-
pours, or Effluvia's, by the Pores of the Skin, to
prevent Putrefactions, and cure them; to carry
off venomous Particles in the Plague, infectious Di-
stempers, Bitings of Serpents, mad Dogs, &c. ill
Fumes, Wind in the Bloud, or Habit of the Body,
that causes Stitches, Tumors, &c.*

2. *To carry off noxious Humours the same way,
especially such as stagnate or offend in the Ha-
bit of the Body; as in Colds, intercutaneous Water,
Leucophlegmatia, and sometimes in Dropsies, (as
Dr. Willis observes) in Declinations of Diseases, to
carry off the concocted morbid Matter in Rheu-
matisms and Gouts, particularly that which is call'd
the Wind-Gout.*

3. *When Perspiration is any way hindred, as by
grievous Passions, Sensations, (or Pain) acid, au-
stere, or cold Humour, by which many Diseases
are caused. Thus 'tis very useful in Grief, Sor-
row, Anxieties, Solitude, Melancholy, Panick Fears,
Cachexies, Scurvies, Hypochondriacal Cases, where-
in it performs wonderfully when all things fail, as
you find in Chap. 24.*

4. To promote the *Menses* or *Lochia*, when stopp'd by reason of the constriction of the Pores by such grievous Passions or Sensations, or by acid, austere, or cold Humours, external Cold, &c. by its relaxing and opening the Pores and Ways, and soliciting the Parts by a gentle agreeable *Titillation*: Hence some justly call it ἀνασωματικὸν τῶν φλεβῶν; that is, An Opener of the Mouth of the Veins, (or Blood-Vessels) by which means (as has been shewn) Puberty, Coition, &c. do kindly and naturally cause the *Menses* to flow, while the same Relaxation causes an Increase of Blood, as it does of Milk, by widening the Vessels. This is all Mechanical Truth, that will answer, upon Experience, as the most Ingenious Dr. Edw. Brown can witness, who is the only Man (as far as I know) that seems to have this Practice.

5. It promotes *Urine*, by the like opening or relaxing of the Pores of the Kidneys by its titillating Volatile Salt, as *Cantharides*, *Bees*, *Pismires*, *Millepedes*, &c. do.

6. It may probably be of great use in cutaneous Distempers, either by taking large Quantities of proper Liquids, and sweating them out again by its help, to wash off ill Particles, or to open the Pores for the admission of external Medicaments.

Note, That they are natural Fluxes it promotes, and unnatural ones that it stops; which proves its operating as an entire Friend to Nature both ways.

I. The *Form* may be which you please, or is most agreeable to the Patient.

II. The *Dose* moderate, except it be when extraordinary Relaxation or opening of the Pores is desired.

III. The *Vehicle* should be such as is proper to prepare the Humours to pass by Sweat, or insensible

fibile Perspiration, or the *Bloud* by the *Menses* and *Lochia*; therefore should (generally speaking) consist of attenuating Things, as *Volatile Spirits*; and in the *Plague*, *venemous* and *contagious Cases*, of *Alexipharmacks*; of *Diureticks* to promote *Urine*; and so in all *Cases* of what is proper in the respective *Humours* for their *Exit* or *Passage*.

IV. The *Time* (because *Sleep* conduces to open the *Pores*) may be at the due *distance* before *Bed-time*; but that hinders not but it may be given, when there is occasion, at any other time.

In the *Plague* it should be so often given as to keep the *Pores* always open. *Mayern* gives an Instance of a *Physician* that had all Signs of *Death*, *Petechiæ*, a *Carbuncle*, &c. who recovered by taking *Laudanum* 6 times a day, (I suppose 24 *Hours*, or the *natural Day* is meant thereby.)

V. The *Regimen* must be such as is proper, convenient, and usual in the *respective Cases*; for 'tis endless to mention all; it requires a *Volume*.

To cause *Sweat*, much temperate *Liquids* must be always given, especially in *Fevers* or *dry Bodies*, as the *Hypochondriacal*, &c. Most part of the *Liquids* should be given before the *Opiate*, that they may have time to get into the *Bloud* by that time the *Opiate* operates, which does so (as was shewn) while 'tis at *Stomach*.

To move the *Menses*, proper means should be used for a due time before the *Use* thereof, because the *Effect* expected in this *Case* from *Opiates*, is only to open the *Ways* or *Pores*: So *Humours* in *Leucopblegmatis*, &c. should be duly prepared for the like *Reason*.

To cause *Perspiration*, it is convenient in *cold Constitutions*, and *old People*, gently to warm the

• *Bloud* with 2 or 3 Glasses of generous *Wine*, a little *Garlick*, *Onions*, *Selery*, or the like, to attenuate and cause *Evaporation*, which *Heat* promotes; but if you over-heat the *Bloud*, it hinders *Perfpiration* by its growing grievous; for what is so, causes *Contraction* and closing of the *Pores*.

Note, That nothing can be so good to cause *Perfpiration* or *Sweat*, because it not only opens the *Pores*, but takes away any grievous *Passion* or *Sensation* that may close them, and attenuates, resolves, &c. by its *Volatile Salt*.

C H A P. XXXVIII.

Of the Use of the Panacea, &c. as a Titillative.

THis it does (as was shewn) by its *Volatile Salt*, as *Cantharides*, *Bees*, *Pismire*, *Sem. Viril.* &c. Therefore,

1. *It is of great use to excite to Venerie, cause Erections, to actuate a dull Semen for the sake of lawful Propagation.*

2. *To increase the Semen; 1. By the Titillation of the Venereal Parts, which invites it thither by the Agitation thereof, as Friction of the Breasts, and those Parts, cause Increase of Milk and the Semen. 2. By the Pleasure thereof relaxing the Parts, which causes a greater Flux of it, (as of Milk to the Breasts, and Nourishment to any Part.)*

It is observable how desirous *Rachel*, being Barren, was of the Opiate call'd *Mandrake*, so that she parted with her *Beloved Husband* to her Sister *Leah* for a Night to purchase it: Whether it was any means to cause her to Conceive, which she did afterwards, is not to be determined, tho' it seems not altogether unlikely.

3. *Its Use to increase Milk is spoken of in the Chapter of its Use to Relax, only it does it here as Titillating, and there as Relaxing.*

4. *It conduces to move the Menfes by its Titillation.*

5. The *Titillation* of its *Volatile Salt*, (as *Cantharides*, &c. do) moves us to *Urine*.

I. The *Form* is wholly indifferent.

II. The *Dose* must be large, and generally greater than any I have mentioned, and possibly requires a *Repetition* thereof to excite to *Venery*; tho' I shall not prescribe any more than I have in the *Table of Doses*, but leave it to *Judicious Physicians* to do as they think fit, where there is a *just Cause* for its *Use*, which I will not expose to every lustful *Goat*.

It is not unlikely but one great Cause of the *Ignorance* of its *Use* to excite *Venery* in these *Western Parts* of the World, may be the smallness of the *Doses* that we use, besides the *Reasons* mentioned in *Chap. 8.* and that such *Circumstances* might occasion the *Disputes* and *Contradictions* that have been about the *Effect* of *Opium*; whereas there is nothing more sure than that it has such an *Effect*, (if the *Dose* be large enough) and that most of the *Eastern Nations* use it for that end with *infallible Effect*.

III. The *Time* should be 5 or 6 hours before the *Effect* is expected, or at *Bed-time*, to cause its *Effects* towards the *Morning*, particularly in the Case of exciting to *Venery*.

IV. The *Regimen*.

As to *Diet*, it must be *Nourishing*, *Warming*, *Comforting*, and *Titillating*, with *realishing* and *high Sauces*, *Oysters*, *Anchovy*, *Caviare*, *Cockles*, *Ketchup*, *Mango's*, *Garlick*, *Onions*, *Leeks*, *Bears Garlick*, *Rocket*, *Sives*, *Shelot*, *Ginger*, *Aromaticks*, *Roots of Satyrion*, *Feaverfew*, *Goats-beard*, *Silver-weed*, *Skirrets*, *Parsnips*, and *Artichoaks*.
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The Use of *Ambergrise*, *Musk*, and *Civet*, is commended; but good *Stomach-Wines*, and the like, are certainly of Use; *Sine Baccho friget Venus*: But it is certain, That *Camphire* and *sulphureous Things unfermented*, as *Oils*, *Resins*, and *fat Things*, oppose *Titillation*, as do also *slimy*, *mucilaginous*, and *cooling Things*.

C H A P. XXXIX.

Of the Use of the Panacea of Opium, &c. to cause Watching.

I Have shewn how *Opiates* cause *Watching* in some *Persons*, by reason of the over-agitating and actuating the *Spirits*, and *Titillating* by its *Volatile Salt*; yet do they, by causing *Pleasure* and *Relaxation*, support the *Spirits*, while the extraordinary *Ovation* of them hinders *Sleep*.

Therefore it is of *Use* to such as it causes *Watching* to, when 'tis requisite for them to watch about any *Business*, *Labour*, *Journeys*, &c.

I. The *Form* may be either *Solid* or *Liquid*.

II. The *Dose* moderate.

III. The *Vehicle* should be *Acids*, or other *Liquids* with *Volatile Salts*.

IV. The *Time* may be at any *Hour* when wanted.

V. The *Regimen*, quite contrary to that of *Sleep* and *Relaxation*, viz. to use *voluntary Motion*, &c.

C H A P. XL.

*Of the Alterative Use of the Panacea
of Opium.*

YOU see the mighty *Extent* and *general Use* of the *Panacea of Opium* as a *Pleaser of Sensation*, which takes up the *Nine last Chapters*, to mention the *Heads of its Performances* without descending into all particulars, because their *Number* is indefinite.

How universal then must its *Use* be, when we add thereto its *Effects* as a consummate *Alterative* which, 1. *Invigorates Nature* by comforting the sublimest Principles thereof, viz. the *sensitive Soul* and *Spirits*, that are the *Original of all Motion and Action*. 2. *Furnishes them with an indefatigable Euphory* in the great *Business of our Preservation*. 3. *Puts the best Means into the Hands of invigorated Nature* for that End, that is, most agreeable Principles, even more powerful, and of a greater *Energy* than our own; which must (as agreeable and exalted *Menstruums* do) resolve all *Humours*, congregating the good, and homogeneous, and separating the effete and heterogeneous Parts, which it, 4. *Discusses and dissipates*, by its brisk and active *Volatile Salt*, and at last, 5. *conveys out of the Body* by a liberal *Perspiration*, the most natural, universal, and copious *Way of Evacuation*.

All which being considered, it is (I think) manifest, that it must excel all other *Panaceas*.

1. Because

1. Because it takes away the Grievance or Form of Diseases upon the very first Administration thereof; whereas other Medicaments do that but gradually as they alter or subdue the Matter.

2. Because it highly comforts Nature (or the sensitive Soul, and Spirits) from the very Commencement of the Cure, and through the whole Process thereof, if duly repeated; which other Medicaments do only by insensible Degrees, as they gain upon the Diseases.

3. Because it procures Sleep, the sweet and chief Refreshment of, and first Cure in Nature, so that I cannot see what can be desired in a Medicament that it is not accomplished with; whereas other Panaceas are deficient, or at least come very short of ours in these extraordinary Qualifications, which seem to make it absolutely compleat and consummate.

4. Because it from the very first composes all Perturbations and enormous Motions of the sensitive Soul or Spirits; which *Helmont* attributes to the *Archæus*, placing all Diseases therein, and therefore says "Ort. Imag. Morb. Sect. 12. *Universale quoddam arcanum consopitivum, & sedativum Archæi est adhibendum*, that is, An universal Remedy, that appeases the *Archæus*, should be used. And what appeases or composes it more than, or as much as *Opiates*? Therefore I cannot wonder that *Paracelsus* should declare that it served his Purpose when all his *Arcanas* fail'd; or that *Helmont* should be in a Rapture upon the Apprehension of the Excellency of *Opium* if the noxious Quality were separated from it, tho' he had a very wrong Notion of its Operation as appears, *Potest. Medicam. Sect. 4:* where he says, that *Opium Archæum abigit, & fugat*, that is, *Opium chases and puts the Archæus to flight*, which on the contrary is highly pleases, and comforts.

It is endless, and a Kind of Impertinence, to descend into Particulars in the Use of a Panacea. Therefore having shown how it operates by invigorating Nature, causing Euphory, Ease, Sleep, resolving all Humours, (*as a general Menstruum, or Alkabeft) congregating the good, separating, discussing, and carrying off the bad Particles, &c. it remains only, that I show you how to use it, as to Form, Dose, &c. leaving the Administration thereof in particular Cases to Physicians, therein concern'd.

I. The Form, that I mainly approve of to alter, is the Liquid, because the solid is in some Measure (tho' not much) impair'd by the Evaporation to the due Consistence, and does not consist of the finest Parts, as the liquid does.

II. The Dose may be at first about 20 Drops, adding a Drop to every Dose, till the Distemper is in good measure abated; then let the same Number of Drops be continued till the Person is well, and afterward abated by a Drop every Day till you come to ten, or less, or to such an inconsiderable Dose, that you can find no Effect at all.

Note, That tho' I am cautious in the Dosing till trusty Experience gives more Assurance, yet do I believe that no Inconvenience will be found by far greater Doses, if by any, unless very excessive, as 1 or 2 Gallons of Wine is in respect of a Pint, which in such Doses may be, and is injurious.

Such as have Pain to be taken off, must use it as is directed in the Chapter of its Use to take away Pain, gradually encreasing so as to keep it off, and when the Cure is in great Measure perform'd, must continue and decrease as is aforesaid; the like is to be said as to Fluxes, &c.

III. The

III. The *Vehicle* may be in general plain *Water*, or rather altered, and made bitter by an Infusion of the Ingredients of the *bitter Decoction*, or *Agrimony*, *Wood-sage*, *Bean Trefoil*, or the like good bitter Things, that are known by *Experience* to cause a good *Digestion*.

In particular Cases the *Vehicle* may be appropriated to the *Disease*; yet always so ordering it, that it may be *stomachical*.

IV. The *Time* should generally be in the Morning, unless *Sleep* at *Nights* is to be procured thereby; if so, you must order Things as in the Chapter of its *Use* to cause *Sleep*.

V. The *Regimen* must be exact *Temperance* and *Moderation* in all Things. and,

1. As to *Diet*, let it be appropriated to the *Diseases*, and always of such Things as the *Stomach* digests without any *Difficulty* or *Disturbance*.

2. As to *Sleep*, it should be moderate, yet so much as fully recruits and refreshes.

3. As to *Rest* and *Motion*, the like *Moderation* must be used; for *Motion* must not be violent, or over-wasting of the *Spirits* in any *Respect*; yet must gentle *Motion* and *Exercise* be used; Riding on Horseback (to such as can do it) is a very wholesome *Exercise*.

4. As to *Excretion* and *Retention*, you should never *Purge*, or *Vomit*, during its *Use*, unless there be a very special Cause; and then I would have the *Vomit* to be only carduated *Water*, and for *Stools*, only so much of the *Scots Pill*, or *Stomach Pill*, as will serve to open the *Body*, to be taken at *Bed-Time*, or at such *Time* of the *Night* as to cause no *Disturbance* before you are up in the *Morning*; but (generally speaking) causing no *Evacuation* is best, but what is the *Consequence* of the *Panacea* it self, which causes the best, most natural, universal, and considerable *Evacuation* by the *Pores*

5. As

5. As to the *Air* the dry, and temperate as to *Heat* and *Cold*, but rather inclining to *Coldness*, is the best; for you cannot so well err on this *Hand*, because the *Pores* will be kept open, and *Colds* prevented in a high manner by the *Use* of the *Panacea*, besides that *Coolness* is most agreeable to *Digestion*.

6. As to *Passions* of the *Mind*, all the grievous ones should be avoided, and a fine even *Chearfulness* maintain'd as much as may be; it will be very easily continued by the *Help* of the *Panacea*, which causes it above all *Things*.

1. *Note*, That these *Directions* do generally concern its *Use* in *Chronical Cases*; for as to *acute Diseases*, and *particular Cases*; it must be left to the *Management* of the present *Physician*.

2. *Note*, That its *Use* as an *Evacuative* has been sufficiently treated of in the *Chapter* of its *Use* to cause *Fluxes* and *Evacuations*.

3. *Note*. That notwithstanding all I have said of the most excellent *Qualifications* of the *Panacea* of *Opium*, I submit all to farther *Experience*, at the *Introduction* of which I mainly aim, by endeavouring to take off *People's Fears* and *Jealousies*; which have ever been the greatest *Hinderers* of *Improvement* in *Cure*, more especially in *Resistance* to the *Use* of *Opiates*, (which without *Doubt*) will cure many *Diseases* more than ever they were used for, (at least as *Alteratives*) which if my *Discourse* does *Occasion*, I shall thank and praise the *Author* of all *Good*, for making me instrumental thereto.

C H A P. XLI.

Of the External Use of Opium.

ITS *External Use* is (as the *Internal*) either,

- I. As a *Pleaser of Sensation* (or an *Opiate* specially so call'd.) or,
- II. As an *Alterative*.

First, as a *Pleaser of Sensation*, (or an *Opiate*, properly and specially so called) it is scarce worth while to treat of it (because of the *Uncertainty*, *Ineffectualness*, and sometimes *Danger* thereof) unless it be to caution Men concerning it; for my part, I seldom or never used it externally, unless it was in *Venice-Treacle*, *Diascordium*, or *Mithridate*, which have but little *Quantities* thereof; nor can I see why it should be at all used externally as an *Opiate*, except it be when *Opiates* cannot be used internally, where they have more even, certain, and better *Effect*; or in very few Cases which will be mentioned: The main therefore that I can do in this Case, is to acquaint you what others have found by *Experience* concerning its *external Use*.

1. It has been found dangerous to apply *Opiates* to the *Sutures of the Head*; it has kill'd some, and *Galen* is against it *L. 2. de Comp. Med.* I have somewhere read of a Man who, after a certain Contest for *Victory*, being very hot, took off his *Helmet* to refresh himself after the *Victory* he had obtain'd; which *Helmet* his *Emulators* smear'd on the inside with *Opium*: He afterward put it on, and soon died.

2. It

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2. It is applied more safely to the *Forehead* or *Temples*, but the Quantity of *half a Scruple* should not be exceeded in this *Case*; *Fernelius* commends the Application of it to the *Forehead* in *Head-Aches*, *Phrenfies*, &c. mixed with *Ointments*; *Wedelius* did also use *Venice Treacle* and *Extract* of *Opium* to the *Temples* with good Success in *Pain* of the *Head*; he also found the like Success in applying it behind the *Ears*.

Note That the Continuance and Constancy of its Operation, where it takes *Effect* applied *externally*, may be very beneficial in some *Cases*; but even that may be answered by *internal Use*, if it be repeated.

3. All, or most, do agree that it is too acrimonious to be applied to the *Eyes*.

4. *Geigerus*, *Fernelius*, *Heurnius*, &c. do commend its *Use* to smell to, being made into a *Ball* &c. with *odoriferous Things*; and I have an *Opinion* that this Way of using it may be excellent, conditioned, that not above *Half a Scruple* of *Opium* be used. 1. Because but a small Quantity, and that of its finest Parts, is thus received into the *Body*. 2. Because it may be removed at *Pleasure*, and then, (as some say) the *Effect* immediately ceases. This is very well worth the experimenting; for it would be very neat to be able to cause *Sleep*, and its other *Effects* with *Safety*, as long, or as short a *Time*, as we please, and no longer; for this cannot be done, when it is *internally* given, but its Operation will have its Course, without extraordinary Means and Trouble; but when *externally* used, the very Cause of the Danger (if any should happen) can be immediately removed, by taking of the *Opiates* from the *Nose*.

5. That of *Geigerus*, and *Langius*, using only one Grain of *Opium* to the *Puncture*, or little *Wound* made

made by a *Leech* behind the *Ear* to cause *Sleep*; and that with *Effect*, seems to me to be attributed more to the *Bleeding*, which always inclines Men to sleep, than to the *Opium*.

6. Crude *Opium* has kill'd People by putting it in hollow *Teeth*, as some Observers aver.

7. Applied to the *Ears*, it relaxes, and (as it were) resolves the *Tympan* and other delicate *Membranes* concern'd, and thereby offends the *Hearing*.

9. *Galen* seems to be against the Application of it to the *Nape* of the *Neck*, because so near the *Original* of the *Nerves*.

Note, That it is not convenient to use it, where *Resolution*, and *Relaxation*, may do any *Harm*, as was said of the *Tympan* of the *Ear*, &c.

10. *Venice Treacle*, *Mithridate*, and *Diascordium*, are safely applied externally to the *Region* of the *Stomach*, to appease *Vomiting* and *Hiccoughs*, moderate *Loosenesses*, &c.

11. *Savonarola* and *Octavius Horatianus* used it to the *Navel* to cause *Sleep*; and with *Rue*, *Myrrh*, *Frankincense*, and *Wax*, to move to *Stool*; which it perform'd (as the last mentioned *Author* says.)

12. *Sylvius* uses it in his *carminative Plaster* to discuss *Wind*, which is rational.

13. Some of the *Ancients* applied it to the *Perinaum*, *Kidneys*, *Region* of the *Pubis*, &c. to chill *Venus* by the cold *Quality* they attributed to it, which is all *Stuff* grounded upon that most absurd *Hypothesis*.

14. They also attributed its *Psilotrick Quality* to *Cold*; than which nothing does more fasten, and cause the *Hair* to grow; as you see in *Winter-Time*, when all *Furrs* are longer, and fastned better to the *Skin*. Into what *Fooleries* a false *Opinion* will lead People.

15. It has been used by *Hieron Mercurialis* in *Ulcers* of the *Womb* with Success, and without danger, as he says, *L. 4. de Morb. Mul. c. 7. p. 281.*

16. It has kill'd People in *Clysters* by sticking to the *Intestinum rectum*, which was doubtless by Reason of its *Rosin*, for it has nothing in it besides the *Rosin* that can stick to do any manner of Harm; which is a most demonstrative Reason of the Perniciousness of its *Rosin*, for if it can kill there, much more where there is such exquisite Sensation, as is at Stomach.

However, 'tis known by Experience that *Venice Treacle* and *Diascordium* are, because of the Dissemination of the *Opium*, and smallness of the Quantity, safe in *Clysters*, and very useful in *Dysenteries* and *Diarrhæas*, as our *Panacea* must be, that has no *Rosin* in it, and dissolvable in *Water*, or any Humours of the Body.

17. It may be used in *Suppositories* when the *Rosin* is separated from it, but I would not advise the Use of above 4 Grains in this Case; or if 8 or ten be used, the *Suppository* should not remain long in the Body. This I say for Caution's sake.

18. It has been used reduced to an Ointment or Balsam with Oil of *Roses*, &c. to the Soals of the Feet, to cause Sleep, with good Success. *Valentinus Polidamus, L. de Doloribus Capitis. p. 78.*

19. *D. Francisc. Hildesheim* asserts, that it takes away Pain in *Cauteries*, but says it is apt to cause *Grangrens*.

20. *Crollius* in his *Basil. Chym. p. 235.* says, That 2 Pills of *Opium*, each containing 8 Grains, being put up into the *Nostrils*, stopt a desperate Hemorrhage at Nose; but I should hardly trust it in this Case. Possibly the Blood might stop by some other Cause, a small *Deliquium* not observed, or the like; for *Deliquiums* still all Motion by a sudden Relaxation which (as has been said) suspends

all Humours, and weakens the Motion of the Heart, (if it does not sometimes quite take it off) for the Time.

Secondly, as an *Alterative Emplastick*, &c. it (as was shown) incises, resolves, discusses, mollesces, maturates, suppurates, and is psilothrick and titillative; Therefore is of Use,

1. In *Pblegmatick* and *Oedematous Tumours*.
2. In *windy Tumours*, *Pains*, *Stitches*, &c.
3. To ripen *Boils*, *Buboes*, *Abscesses*, and the like.
4. In all *hard Tumours* of the *Spleen*, *Breasts*, *Cancers*, *Tophousness*, &c. in which Cases it is (as other *Opiates* are) of excellent Use, by their powerful resolving and relaxing Faculties.
5. To cause *Nourishment* of *Parts*, *Increase* of *Milk*, &c. by *Relaxation*; as *Sleep*, *Puberty*, *Pleasure*, &c. do (as has been shown.)
6. To cause the *shedding* of *Hair* by *Resolution* of the *Parts*, as by a *Cautick*, *Vesicatory*, &c. with which it agrees in its *exulcerating Faculty*, when it is very strong, as the true *Maslach* (or *ὀνός*) which we have not.
7. To excite to *Venery* by its *titillating Volatile Salt*, if apply'd to the *Perinæum*.

YE blessed Minds! who in an instant know
 What in five Thousand Years none here below
 Could learn! How mean are we? how great are you?
 O, for your happy State! while dull Mankind
 Off' see and feel the Things they cannot find.

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Who did not see the Bloud move to and fro?
Yet could none its Circulation know,
Till God enlighten'd Harvey; then did he
Perceive what others seeing could not see.
So till God was to my Enquiries kind,
Millions sought and felt what they ne're could find. }
What is vain Man, without th' all knowing Mind? }
To whom all Glory be, all Thanks, and Praise,
As was, is now, and fit to be always.

Amen. Amen. Amen.

FINIS.

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Who did not see the blood in the water
And could not see the blood in the water
The blood in the water was not
The blood in the water was not
The blood in the water was not
The blood in the water was not
The blood in the water was not
The blood in the water was not
The blood in the water was not
The blood in the water was not

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Amos. Amos. Amos.

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